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To consider and take action upon all general questions relating to the navigation and carrying business of the Great Lakes, maintain necessary shipping offices and in general to protect the common interest of Lake Carriers, and improve the character of the service rendered to the public.

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NAVAL CHANGES.

With the beginning of the year Rear Admiral George E. Belknap goes on the retired list of the navy, in which he has borne honorable service during a period of forty-six years, beginning as a midshipman in 1847 (at the age of 15) and ending with the command of the Asiatic station, from which he returned in 1892. His war record was that of a junior officer who participated in the reinforcement of Fort Pickens, in 1861, the siege of Charleston and the capture of Fort Fisher. As commander he was the senior officer present at Honolulu on one occasion when serious political disturbances arose, and he landed a force from the Tuscarora and the Portsmouth which preserved order for several days.

Six officers of the navy who have been enjoying long leaves of absence, with high salaries for work with private establishments, have been advised that their leaves will be revoked with the closing of the year 1893. They are Lieut. C. A. Stone, on duty with Carnegie & Co.; Chief Engineer L. W. Robinson, on private duty in Chicago; Chief Engineer N. P. Towne, on duty with the Messrs. Cramp; Lieut. Comdr. William Swift, on private duty in Philadelphia; Lieuts. O. W. Lowry and C. W. Jungen, employed by the Reform School of New York, and Boatswain J. A. Aiken, with the Messrs. Cramp.

ELECTRICITY ON THE CANALS.

Referring to the recent alleged successful experiment of using electricity as a motive power on the Erie canal, State Engineer Schenk observes: "Successful? Why, of course it was successful. I never heard of anybody doubting that by attaching a current of electricity to the machinery that turns the wheel of a steam canal boat you could make the wheel turn and the boat go. Nothing was demonstrated except the fact that the electric power would turn the propeller of a canal boat just as it would the wheel of a car. The truth of the matter is that the trolley system of supplying power to canal boats can never be of any great value to canal traffic with boats in this state as they exist to-day. The electric trolley canal boat, with its three or four consorts, is as helpless when it reaches the river as the horse boat. The steam canal boat, however, when it reaches the river does not have to wait till a tow is made up and then pay $25 a boat to be moved to New York, but can get right out into the river and perhaps pick up an extra horse boat or so, which got in just too late to get a place in the regular tow. Moreover, the steam canal boat is running to-day up to the limit of speed allowance on the canals. They run four or five miles an hour, while the electric boat could not run six or eight miles an hour without washing the canal banks. I have seen a steam launch run in the canal so that you could see the bottom of the canal in her wake. I cannot see where the trolley system is going to work any benefit to the boats that leave the canal and travel down the river, as most of them do."

SUBSIDIZED MERCHANT NAVIES.

Richard P. Joy, in a pamphlet entitled "How Foreign Nations Protect Their Merchant Marines," deals with substantial truths in his advocacy for the betterment of the United States mercantile marine.

Mr. Joy says: "By extending protection to their great steamship lines foreign nations achieve two highly beneficial ends at one stroke, namely, pay into their own pockets for transporting their own commerce, and also receive pay from Americans for transporting theirs, besides having naval reserve cruisers in case of war. Ninety per cent. of American commerce is carried in foreign vessels, which means that the people of this country pay into the pockets of foreigners $200,000,000 yearly for transportation. In addition to this enormous sum the United States Government paid to foreign steamship lines for transporting the United States mail during the fiscal year 1892, $449,405.14. Thus we subsidize foreign steamship lines and aid them to maintain themselves against American lines. Thus for transporting passengers, mails and freights, the American people pay abroad $200,449,405.14 yearly, which is an indirect and unjust tax levied by the neglect of the Congress of the United States upon its citizens at the rate of $3.33 per year for every citizen.

The following figures are from the inaugural address of the President of the 'Institution of Engineers and Shipbuilders in Scotland.'

"'The total sum of subsidies paid by Great Britain, France, Germany, Russia and Italy is $16,657,865, of which Great Britain pays twenty per cent.' This does not include the bounties paid. From the following table it is seen that foreign governments appreciate the value of maintaining sea-power at any cost, and of paying to themselves for transporting their own commerce and ours.

Company.	Subsidy in Dollars.	Earnings and Dividends.	Adverse Balance Without Subsidy
French Transatlantic.....	$2 231 600 00	$400 000 00	$1 831 600 00
Messageries Maritimes....	2 770 000 00	600 000 00	2 170 000 00
North German Lloyds.....	1 100 000 00	150 000 00	950 000 00
Peninsular and Oriental...	1 700 000 00	689 000 00	1 011 000 00
Cunard Line	250 000 00	34 570 00	215 430 00
Royal Mail Packet Co....	450 000 00	1 510 00	448 490 00

"In addition to the above postal subsidies the Cunard Line has subventions from the Admiralty annually of $67,500 and the Peninsular and Oriental of $61,745, besides the mail subsidy paid to foreign steamship companies by the United States Government. Thus we aid in maintaining cruisers for foreign governments to be used against the United States in case of war.

"The above table shows conclusively that it is the greatest folly for Americans to endeavor to compete with these foreign subsidized lines without a like subsidy, and as yet we have no adequate subsidy sufficient to encourage an American company to enlist in foreign trade. Can any of my free ship friends show me how free ships will help us out of this hole? We could not operate against such odds if foreigners would give us ships for the asking, and we must be content to pay still to foreigners for transportation unless wisdom can be driven into the brains of our legislators.

"No one asks for free ships—even shipowners have testified in Congress that Fithian's Bill would do more harm than good, as Americans could not operate them if they had them. Give the American shipowner the benefit of discriminating duties and also the mail subsidy now paid by the United States to foreigners.

"In building a steamship in America it has always been the pride of our naval architects to turn out a ship of the best design and superior workmanship, and to slight no part of the construction. Thus our ships cost more to build than do the cheap built foreigners, 'which are built by the running mile and chopped into the length desired by purchasers.'

"The cost of a cheap steamship in England is about twenty-five per cent. less than in America, for the reason that material is cheaper in England and labor receives pauper wages, and as labor is ninety per cent. of the cost of construction it gives English shipyards a great advantage over American, where are paid comparatively high wages. For the same reason a ship can be operated more cheaply under the British flag than under the Stars and Stripes, and the British Lloyds help on the good work of protecting the British Marine by granting a better rating to poorly built British vessels than to the superior product of the American shipyard. These natural advantages are aided in some countries by bounties paid to shipowners.

"Thus it is seen we can neither compete on the ocean under present conditions, with the swift mail steamer or the cargo carrier, unless our Congress extend some aid to American shipping. I have always advocated discriminating duties as a remedy, and I still believe that our shipping could be restored by charging goods imported in foreign vessels a higher rate of duty than goods imported in American vessels, thus increasing the revenue of the Government, restoring the American vessel to the seas, and securing to our people the enormous sum now paid to foreigners, which aids in throwing the balance of trade against us, as we receive no adequate return."

THE fifth annual meeting of the American Society of Naval Engineers was held in the office of the Engineer-in-Chief of the Navy last week, December 22nd, for the election of officers for the in-coming year, and for the transaction of such other business as might come before it. The report of the treasurer shows a highly gratifying condition of finances, the amount on hand for the calls of the new year aggregating something over $1,500, with all bills paid to date. The membership of this society shows healthy growth. The following officers were elected for the coming year: President, a re election, Chief Engineer, Harrie Webster, U. S. N. secretary and treasurer, P. A. Engineer Robert S Griffin, U. S. N.; members of the council, P. A. Engineers Frank H. Bailey, U. S. N., and Ben. C. Bryan, U S. N. The third member will be elected by the council which is composed of the president and secretary and treasurer and three members. Interesting papers by F. H. Bailey and B. C. Bryan were read, which will be published in the journal of the society later.

NEWS AROUND THE LAKES.

CHICAGO, ILL.

Special Correspondence to The Marine Record.

Grain freights for winter storage and delivery in Buffalo are now quoted at 3 cents on wheat.

The steamer City of Glasgow, which was chartered Saturday by J. J. Rardon & Co. for wheat to Buffalo at 3 cents, was towed to South Chicago Tuesday to load by the Dunham Line tugs O. B. Green and Hackley.

The barge Verna, which was chartered ten day ago by W. M. Egan for 45,000 bushels of wheat to Buffalo, was towed Tuesday by the V. O. T. tug Protection to the Santa Fe elevator to load.

The members of the Shipmasters' Association at this port are selling a large number of tickets for their banquet and ball to be held at the Tremont House on the 17th inst. They expect a large attendance.

The Goodrich Co.'s steamers Menominee, Capt. John Gee, and City of Ludington, Capt. H. E. Stines, are running along the west shore as far as Green Bay, making trips from here about five times per week.

The steamer C. H. Bradley and barge Brightie, which were chartered to load wheat last week, were towed to the Santa Fe elevator Friday and Saturday by the tugs Green and Hackley of the Dunham Line.

I met F. A. Leopold, agent for the Vacuum Oil company in this city on Tuesday, busy looking after buiness among the stationary engineers. He did a good marine business last season and hopes to be around again among the steamers next season.

W. E. Fitzgerald, secretary of the Milwaukee Dry Dock Co., was in this city Tuesday on business. He informed your correspondent that his company have the steamer John Adams in dry dock giving her some new bottom planking.

The Dunham Towing and Wrecking Co.'s tug T. T. Morford went recently to the sunken tug Crowell, off Michigan City, and anchored a buoy over the spot where she went down. The company will endeavor to raise her in the spring.

I am pleased to report that Hugh Kelly, the well-known stevedore, is recovering, although slowly, from a serious injury to his knee-cap which he met with through a fall when getting off a street car two weeks ago.

Capt. Thos. Holland, of the tug Torrent, has sold the boiler, 6 feet diameter, 12 feet long, which was formerly on the small iron tug McCormick to Joseph Seitz, of Manitowoc, who intends to place it on board his fishing tug.

The steamer City of Berlin is having a long wait for unloading her cargo of coal at Peabody's dock. Meanwhile Capt. John Buie is getting her well brined. She continues to leak badly and the V. O. T. tug Van Schaick pays her a visit occasionally and syphons out the water.

Capts. P. Shea and M. Folan of the Western Line steamers Buffalo and Milwaukee, left Chicago for their homes at Buffalo on December 7th and Capt. Frank Williams of the steamer Harlem, on Deceuber 30th after having their respective steamers securely laid up for the winter.

At Miller Brothers' ship yard the steamer Cuba, was in dock for fixing rudder pintels, shoe and stern bearing, the tug Wm. Dickinson to ship a new rudder, the tug Mentor for a piece of new stern and fore foot, the schooner City of Sheboygan to have a leak stopped, and calking bottom, two of Fitz Simmons and Connells dredges for repairs and calking.

Capt. J. B. Osier, who was very many years ago a master on the lakes and was harbormaster at this port some twenty years ago, and a vessel and insurance agent on South Water for several years afterwards, is now in his 94th year, having been born in 1800, and is hale and hearty, although a little under the weather just at present. He expresses the hope that he will yet see many more happy new years.

Capt. J. W. Calbick, of the firm of Cook, Calbick & Co., vessel agents, returned on Saturday from Detroit. He had been there in the interests of the underwriters selling the 6,600 bushels of wheat on board the schooner J. I. Case and having a survey held on her to ascertain the cause of the leak. He also paid a visit while away to the steamer City of Concord. She was raised Wednesday last and found not burned as badly as anticipated. It is probable she can be repaired without going into dry dock.

At a meeting of the Shipmasters Association, Chicago Branch 3, held Wednesday December 27th, for the purpose of appointing officers for 1894, Capt. George Tebo was appointed president, Capt. George Pardee, vice president, Capt. H. J. Hatch, 2nd. vice president, Capt. Wm. G. Turner, treasurer, Capt. F. B. Higgie, secretary, Capt. George Tebo, delegate to Grand Lodge. The delegates to the Shipmasters Association Convention to be held here the week commencing January 15th, will be entertained at the Trenton House by their Chicago brother shipmasters during their stay in this city.

DETROIT, MICH.

Special Correspondence to The Marine Record.

The big steamer Centurion, which has been in the Detroit dry dock for several weeks, has been finished. Her repairs cost about $9,000.

Mechanical superintendent Whittaker has ninety men at work on the Grand Trunk car ferry Great Western. He expects to have the job finished by January 20th. The boat is being rebuilt and will look like a new vessel when completed.

The Mullen-Gatfield Coal Co. sold over 28,000 tons of coal during the past season at their Sandwich and Amherst ferry docks. The quantity handled at the latter place is 4,000 tons greater than during any previous year.

A. A. Shantz reports that the crop of poets who lay siege to his office is greater than ever before. The favorite subject seems to be Mackinac Island. Some very fair verses on that topic were received last week.

J. C. Goss & Co. report business as very much slower than at this time last year. Vesselmen are holding off and even those who have needed to make repairs are waiting. The firm are confident, however, that orders will come with a rush later.

Neil McMillan, for many years secretary and manager of the Detroit Sheet Metal & Brass Works, has retired, having sold his interest in the concern to Harold D. McMillan, son of Gilbert McMillan. The retiring manager was presented with an elegant diamond stud by his former associates in the business.

The big schooner G. W. Adams collided with the Case while they were in the ice fields at the head of Lake Erie. She was considerably damaged. Repairs were made at the Clark dry dock, where she was also recalked. The vessel was last week chartered by broker Norton for wheat to Buffalo with winter storage at 2½ cents. She will load about 80,000 bushels.

The schooner J. I. Case was found in a leaking condition recently with four feet of water in her hold. About 10,000 bushels of her cargo of wheat was damaged. It was sold last week at 22½ cents a bushel and shipped to the Brantford starch works. It is not yet known what caused the leak, but floating ice probably had something to do with it. The vessel will be docked soon and a survey held.

A survey recently held on what is left of the steamer Mascotte, which burned at New Baltimore, Dec. 6, places the loss at $22,000. The hull is badly warped and cracked by the heat and is hardly worth repairing. The owners, however, Stevens & Marsh, are undecided what to do, but as there is no boat for sale so well adapted to the St. Clair route, they may be obliged to rebuild her.

Last fall, just before the close of navigation, the schooner Lem Ellsworth started from Cleveland bound for this port with a cargo of coal. She got stuck in the ice and was compelled to return. The lake, however, became clear of ice and the owners hired a tug which successfully brought her into port last Monday. This is rather astonishing considering the time of year. Last season during the Christmas holidays the river was filled with ice over a foot thick.

John A. Worcester, receiver of the Davis Boat & Oar Co., was last week authorized by Judge Frazer to begin suit against Edgar A. Davis, the former president of the company, to set aside certain conveyances of real estate and sales of personal property owned by Davis and his wife. It is alleged that the greater part of the real estate mentioned belongs to the company. Worcester has filed an affidavit to the effect that Davis purchased property with the funds of the company and took possession in his own and wife's name.

The insurance men of this city, and representatives of companies in other states doing business here, claim that no money was made during the past season. James J. Clark, vice-president of the Detroit Fire & Marine, says that the losses on the lakes will foot up to $1,800,000 against net premiums aggregating $1,400,000. most of the losses occurred during the months of April and October. It is claimed that competition has forced the taking of risks below a healthy basis, and that the system of rebates was ruinous. No underwriters have failed yet, but there may be some who will go out of the business before next season opens up.

The E. C. Pope is still in the Detroit dry dock and will probably remain there for three or four weeks. Some 125 men are at work replacing sixty plates and repairing 138 frames. Not a plate was broken, although they were badly strained and bent. She received the damage at the Lime Kiln crossing at the time the Lockwood blocked the passage.

The annual meeting of the Lake Carriers' Association which convenes here Jan. 17, will attempt to settle the question of establishing a uniform schedule of rates for carrying grain, lumber and ore, such as the interstate commerce commission has compelled the railroads to adopt. Opposition may be developed by those railroad companies owning lines of steamers. A prominent vessel owner here, said last week that more tonnage lost money last year, than made any, and that the prospects were not bright for next season. It is claimed that no vessel can make money carrying ore between Lake Superior and Lake Erie ports for 50 to 60 cents per gross ton, or coal for 30 cents per net ton. A schedule is a necessity, he said, so that all may have an equal chance, and rate cutting prevented. G. L. C.

LAKE SUPERIOR IRON ORE MINING.

Special Correspondence to The Marine Record.

DULUTH, MINN.—The recent sale for a large sum to the Chicago & Minnesota Ore Co., of the Wyoming Iron Co's. leases on the Mesaba range, calls attention to the Iron King mine, on these leases, and also to the extent of the present holdings of the purchasing company and its owner the Minnesota Iron Co., on the new range. The Iron King lies in sections 17, 19, 20, town 58—17, the phenomenal iron township of the Mesaba. It was opened by N. D. Moore, well known through Wisconsin from his meteroic connection with the Gogebic range 10 years ago. He opened the Iron King under a 20 cent sub lease from the Wyoming, which itself paid 30 cents a ton royalty to one of the big lumber companies of this state. Some 38 pits were sunk in ore during the past autumn, marking out an area of deposit some 3,200 feet in length, northeast and southwest, by 600 feet wide on the average. One pit was sunk 238 feet, through to the bottom of the ore body, 220 feet being in ore. The rest were put down from 10 to 90 feet in ore without going through it. The ore body lies on a gentle slope to the westward, and is apparently well drained. It is covered by an average surface of 25 feet of clay and gravel, and this Minnesota Iron Co. is now receiving bids for stripping off 300,000 yards of this surface for mining operations next summer. As there are very few granite boulders and little hardpan in this surface, steam shovel stripping will be practicable—which it is not, by the way, in some other Mesaba stripping mines. The ore in this vast deposit is a brown and under it a blue, granular hematite, a good deal like that of the Biwabik. It assays about 64 to 65.30 iron, .020 to .037 phosphorus and about 3 silica, while the per centage of water is about as in all Mesaba ores. The purchase of the property by the Minnesota Co. wipes out a 1 intermediate title and gives it an immediate connection with the fee holder and a 30 cent royalty. It is two miles from the line of the Duluth Iron Range road and a branch will be built at once.

At the time of the organization of the Lake Superior Consolidated Iron mines the story was that the Minnesota Iron Co. had, and could get, practically nothing on their new range. As the situation has clarified, however, it is beginning to be recognized that the Minnesota has very respectable holdings on the Mesaba. These holdings, too, are in the way of being increased at no distant day. The Iron King is an enormous deposit, as is the Norman, north of it are surface mines, and both are absolutely controlled by the Minnesota under 30 and 25 cent leases. The Canton is a large underground mine of the companys, while the Franklin, which is a magnificent property, also underground, is closely identified with the Minnesota. In good times it alone should furnish 300,000 to 500,000 tons of freight annually. Hale has contracted a minnimum tonnage of 50,000 tons a year for 6 years over this company's road, and whatever ore the Cincinnati and many other properties may ship will be over the Iron Range road. So it will be seen that the road and mining company are very well represented on the Mesaba.

It has been decided because of the cold weather and the rapid making of frost in the ground, to suspend operations at the Mountain Iron, of the Consolidated. The work will be resumed about March 1st. This leaves only two Mesaba mines in operation, the Canton, 200 men, and the Biwabik, 350.

CLEVELAND, O.

Special Correspondence to The Marine Record.

George Lehrman, inventor of a life saving helmet or mask designed to keep a person from being smothered in broken water, will give an exhibition of the merits of his invention at Rumsey's baths in a few days.

The steamer Pentland, built at Grand Haven for W. H. Loutit will be fitted by Frank Morrison with binnacles, compasses and what is known as the optician's outfit, marine glasses, etc.

Mr. Russell, traveling salesman for the Crosly Steam Gauge and Valve Co., spent a few days at this port during the week visiting vessel owners and managers in the interests of his firm.

Mr. Sinclair Stuart, chief surveyor of the Standard Classification society, New York, has arrived at this port to attend the launch of the North West on Saturday next. This handsome vessel has been built under the rules of the U. S. Standard Register and is given the class of AI* for twenty-five years.

There is a quietus reigning over marine circles at this port just now and the usual dividend era is not tinged with the golden hue of former seasons. A large number of owners would rather have the valuation of their tonnage to their bank account than invested in questionable paying bottoms which may do little better next season than last.

The Shipmasters' and Engineers' Associations are taking steps to widely petition against the duty being taken off iron ore as they fear that with the diminished employment for the boats many of them will be left without positions next season and earnings have been curtailed enough already as several owners made deductions from their last season's wages.

Considerable interest is evinced regarding the launch of the large passenger steamer North West from the yards of the Globe Iron Works Co. next Saturday and visitors are expected from Duluth to New York. The date and hour seems to be not clearly known by a number of persons that desire to attend, yet the builder's announcement states Saturday, 3 p. m. city time or 2:30 standard time. The steamer will be christened by Mrs. F. P. Gordon, representing the Northern Steamship Co., and launched by Miss M. Gertrude Hanna, representing the Globe Iron Works Co.

An excellent and speedy job of repair work has just been completed by the Cleveland Ship Building Co., on the steel steamer Cadillac, owned by the Cleveland Cliffs Iron Co. This steamer was placed in the Cleveland Dry Dock and twenty-six plates were taken off her bottom, keel and bilge, all of which with the exception of two, were re-rolled and put back, twenty broken frames and floors were refitted and besides it was found that several rivets in each frame were sheared and loose for the whole length of the bottom, these were all replaced with new rivets as well as being butt strapped and scarphed in several places, the whole work taking only eight days. Mr. Thos. Bristow, of the Cleveland Ship Building Co., superintended the work and is entitled to much credit in the handling of this large repair job on bottom damage.

The annual report of S. D. Brooks, past assistant surgeon United States marine hospital service, stationed at this port, furnishes the following data relative to the work done by the hospital department:

	1880.	1891.
Total number seamen treated	283	1,545
Total number treated in hospital	165	311
Died	3	7
Number of days treatment in hospital	4,752	8,565
Number of seamen furnished office relief	118	1,232
Number of times office relief furnished	213	2,000

Number of seamen treated at Cleveland	1,545
Number at all ports on the Great Lakes	11,651
Number at all U. S. ports (Atlantic and Pacific coasts, Great Lakes and navigable rivers)	53,610

Expenses for the year at Cleveland	$10,918.85
Tonnage tax collected at Cleveland for support of Marine Hospital service	118.82

In 1880 Cleveland ranked twenty-second among the ports of the United States in amount of relief furnished seamen. The latest report gives her the twelfth place.

The election of officers by the Shipmasters' Association at this port resulted as follows: President, C. E. Benham; first vice president, Richard Naville; second vice presicent, Carleton Graves; treasurer, Thomas Jones; financial secretary, Frank Brown; recording secretary, Cooper Woodsell; delegate to grand lodge at Chicago, C. E. Benham; alternate, John Lowe.

Capt. McKay, marine clerk, has compiled the most complete custom house statistics for the annual report of M. B. Gary, collector of customs, that has ever been got together at this port. Official information was supplemented by private inquiries and the result has been to show a larger volume of commerce than has heretofore been credited for the district.

OBITUARY NOTICES.

The many friends of Capt. Robert Gain were sadly shocked to learn that he had dropped dead at his residence in Port Huron on Christmas morning.

The captain arose Monday morning at the usual hour in apparently excellent health. He gave his children a number of Christmas presents and was sitting in a chair explaining to his youngest, a baby of three years, about Santa Claus. Suddenly and without apparent warning, he was seized with a chill and complained of great pain in the region of his heart. Before aid could be summoned he fell over dead. It was a great shock to his family as it was entirely unexpected.

Capt. Gain was born in London, Canada, 49 years ago. At an early age he turned his attention to the vessel business and had been engaged upon the Great Lakes during the greater portion of his life. For several years he was master of the steamer W. H. Sawyer, a boat which was built under his personal supervision and of which he was one of the owners. He has also sailed the steamers Birkhead and Curtis for seven years, being connected with that line of boats for several years.

He leaves a wife and four children, two boys and two girls, his eldest being a boy of fifteen years of age and the youngest a girl of three years. He also leaves four brothers and one sister, Mrs. Wanless, of Port Huron, John Gain, of Grand Rapids, William Gain, of Sparta, Mich., Amby Gain, of Port Huron, and George Gain, of Detroit.

Capt. Gain carried a life insurance of about $9,000 in several societies. He was a prominent Maccabee and Knights Templar, and was also president of the Shipmasters' Association of his home port for several terms.

Since he returned home this fall from his season on the lakes he has complained of severe pains in the region of his heart but none of his family had suspected that he was afflicted with heart trouble.

The sympathy of the entire community goes out to the family in the loss of a husband and kind father, who was also a representative shipmaster and well liked by all with whom he was brought in contact, afloat and ashore.

Capt. John Stevenson, whose death occurred in Detroit on Monday, was well and favorably known to the sailing community. He had been a master for several years and during the season just closed had charge of the tug Howard. He was a prominent Mason, being a member of Detroit Lodge No. 2, F. & A. M. He was a man who was held in high esteem by all his associates and his untimely death in the prime and vigor of manhood was indeed a sad blow to his family and friends. The funeral which was held from his father's residence at Port Huron, was a largely attended one. The Masonic order accompanied the remains of their deceased brother to the grave. Telegrams of sympathy were received by the parents from W. H Singer, Chicago, owner of the tug Howard, and also from friends in Detroit. The captain was highly respected and had many friends who will be grieved to learn of his summons to keep his long quiet watch.

FLOTSAM, JETSAM AND LAGAN.

The grand lodge of the Shipmasters' Association, made up of the presidents and delegates of the local lodges, will meet in Chicago, January 16th.

The fish tug Edna Goodill cleared from Erie, Pa., last Thursday, to fish off Cleveland as long as the lake front remains clear of ice as it now is.

Capt. Charles Swartwood was removed from Huron Street hospital to his home yesterday.

The steamer Christopher Columbus will run in the excursion business between Chicago and Milwaukee next season.

Harvey H. Brown is the name of the large steel steamer now approaching completion at Wyandotte.

There are still four unclaimed bodies among the victims of the Albany-Philadelphia collision. They have all been buried at East Tawas. One has never been identified.

J. M. Jones & Co., vessel and insurance agents, 18 Board of Trade building, Detroit, have just published a list of seventy-seven vessels for sale. The list includes all classes of lake, river and harbor tonnage.

The owners of the steamer Samuel Marshall and consorts Maxwell and Tilden, caught in Detroit with lumber cargoes bound for Tonawanda, do not propose to move the lumber this winter and will not give it up till the freight is paid.

The loss on the propeller S. E. Peck, incurred in going ashore at Bar Point on Sept. 17th, was, so far as the insurance companies are concerned, $27,625.56. Smith, Davis & Co., of Buffalo, have paid their proportion of it. The report is that Capt. Green is preparing to change her name to the Lewiston. It was the intention to change her name when he bought her, but for some reason it was not done then.

Vessel rates to Buffalo ranged very low throughout the past season, but the vessel interests had a hard year, the highest rates on corn to Buffalo being 2½c. and the lowest 1c. Railroad rates held steady at 25c. per 100 lbs. on flour and grain and 30c. on provisions to New York until about Dec. 1, when navigation closed and the railroads commenced cutting rates so that a reduction of 10c. was made.

The following summary of casualties occurring upon the Great Lakes during the season which has just closed has been tabulated by Capt. Henry Doville, of Sodus Point, N. Y., who has made a practice of recording lake casualties: Vessels lost during the year, 56; value of same, $1,240,000; value of vessels and contents lost by stranding, fire and collisions, $2,212,558; number of lives lost, 128, of which one was lost by being swept from a steamer during a storm and four jumping over board to commit suicide. The lives lost were 59 on Lake Erie, 33 on Lake Huron, 12 on Lake Michigan, 10 on Lake Superior, five on the Detroit river and four on Lake Ontario.

Two surveys of the damage inflicted upon the J. C. Lockwood's stern by the steamer Onoko have been held and the estimated cost of making repairs in each case was $5,000 or a trifle over. This will fall upon the underwriters, as the Onoko's insurance policies contained the collision clause. The Owen estate will be held for the damage done to the Lockwood's bow by the schooner E. A. Nicholson, as both the schooner and the steamer J. Emery Owen, which had her in tow, can be proceeded against. The Nicholson stove in the bluff of the Lockwood's bow twenty-five feet abaft the stem, making a hole which had a width of twelve feet at the top and tapered to the width of the schooner's forefront at the bottom, a distance of fourteen feet. The force of the blow drove the heavy steel chord which traverses the upper line of the hull and started the hoods from the stem. The Lockwood is to be thoroughly refastened throughout.

ARRIVALS OF VESSELS IN THE DISTRICT OF CHICAGO, 1893.

PORT OF	COASTING TRADE. American vessels		FOREIGN TRADE. American vessels.		FOREIGN TRADE. Foreign vessels.		Total.		Totals.	
	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.
Chicago	7,898	4,835,252	76	30,669	37	26,659	113	57,328	8,011	4,892,580
South Chicago	497	505,626	....	.....	....	.....	.....	.....	497	505,626
Michigan City	246	58,431	....	.....	....	.....	.....	.....	241	58,431
Total	8,641	5,399,309	76	30,669	37	26,659	113	57,328	8,754	5,456,637

CLEARANCES OF VESSELS IN THE DISTRICT OF CHICAGO, 1893.

PORT OF	COASTING TRADE. American vessels		FOREIGN TRADE. American vessels.		FOREIGN TRADE. Foreign vessels.		Total.		Totals.	
	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.
Chicago	7,679	4,666,150	344	220,390	39	28,314	383	248,704	8,062	4,914,854
South Chicago	474	474,969	....	.....	....	.....	.....	.....	474	474,969
Michigan City	253	59,647	....	.....	....	.....	.....	.....	253	59,647
Total	8,406	5,200,766	344	220,390	39	28,314	383	248,704	8,789	5,449,470

NORWEGIAN SUPERSTITION.

The simple faith of the Norwegian peasants is that the seeing or not seeing of beings of the other world is a mere question of strong or weak nerves. Only, reversing the generally accepted belief, it is the Northman of strong nerves, says *All the Year Round*, who has power to see the unseen. And he who sees it fears it not. "If you have the gift," says my informant, "you may see dozens and scores of forms pass your door, but you know not what it is to feel alarm."

"There's a ghost on every ship," says the same authority. "My own uncle who saw the unseen plain from his childhood, was married to a woman who could not believe in spirits. He had a fishing smack of his own, and saw strange things of nights. One night he asked her to go out with him, and she went. 'If I see anything I will call for you,' he said, and she agreed to it. In the dark middle of the night he could see three men come walking on the water toward the little vessel. He went and called his wife, saying:

"'Look out now; do you see nothing?'

"'No,' said the wife. 'I see nothing but the water and the darkness.'

"'Well,' said he, 'there are three men there, plain to be seen, and now I'll go and get up the nets, for a storm is surely coming.'

"Two o'clock was the wonted hour for getting up the nets, but wait he would not, in spite of all that his wife could say to him.

"When 2 o'clock came the nets of all the other fishermen were lost, and their boats nearly wrecked in a sudden great storm that rose, but my uncle was well out of it, and anchored in safety, because he could read the signs they were all blind to."

ARCTIC EXPLORATION.

Although some general reference to the scope of the Arctic expedition proposed by Robert Stein, of the Geological Survey, have crept into the newspapers within the last few weeks, little has been said as to the material progress Mr. Stein is making.

An advisory committee, consisting of Gen. A. W. Greely, chief signal officer of the army; Prof. T. C. Mendenhall, superintendent of the Coast and Godetic Survey, and Commodore G. W. Melville, engineer-in-chief of the navy, will pass upon the personnel of the expedition. More than sixty applications have been received, and, as the party will not consist of more than fifteen men, the list will have to be pretty carefully weeded. It is probable that when the fact is fully understood that this is not an expedition for anybody's self-glorification by reaching a point further north than previous explorers have attained, but has for its object the scientific investigation of a territory already trodden by white men's feet in some of its parts, doubtless its attractions for mere adventurers will be much modified. At the same time it will not be devoid entirely of romantic interest for the benevolently disposed, since it is one of Mr. Stein's plans to hunt for and rescue if possible the Swedish exploring party who disappeared somewhere in the neighborhood of the Cary Islands, near the mouth of Smith Sound.

Of the candidates who have thus far come forward, seven are of German birth, three are English, one a Canadian and one an Armenian. The rest, so far as their nativity can be ascertained, are Americans. The Germans consist of three expert machinists and four men of scientific proclivities who have each served three years in the German army and learned the lessons of discipline instilled there. Of the Englishmen, one is a captain in the English army and another is an engineer who is thoroughly conversant with the management of steam launches—the sort of craft in which one of the sections of the expedition will go north up Smith Sound in search of the Swedish party. The Armenian is an artist, who is willing to undergo all the perils and hardships of arctic exploration for the sake of the sketches he will be able to make. Another artist has applied—an American photographer, who urges the further recommendation that he is a crack shot with either rifle or fowling-piece, and has had a considerable experience of military discipline.

Besides these the list of applicants includes two mining engineers now in the employ of Pittsburgh companies; four surveyors and civil engineers who have plied their calling in the wildest parts of the West, far from civilization, and are full of resources for roughing it; two geologists, both of them college professors; one mining prospector who has penetrated the interior of Alaska with a small party, and there learned the art of primitive boat making and navigating when he and his companions were in straits for means of water conveyance; one man formerly connected with the United States Irrigating survey, and one anthropologist, whose aim is to study a tribe of Esquimos said to inhabit a peninsula jutting out from the west coast of Ellesmere Land, and understood to have never seen white men. It is believed that this tribe will present a better illustration of primitive traits and modes of living than any other yet noted in the chronicles of explorers. The amount of money at first deemed necessary to equip the expedition was $10,000. It now appears, however, that $15,000 will be required to assure the best results, especially since it has been decided to undertake a search for the Swedish party and to establish another permanent station at Cape Warrender. Of this amount $5,700 has been promised. Nine men who have applied for places on the expedition have offered to subscribe $500 each; two publishing houses have offered to make up another $1,000, and two scientific societies will contribute $100 apiece. Mr. Stein is in hope that other friends of science will lend their aid soon enough to enable the supplies, apparatus, etc., to be laid in before the date set for starting in the spring.

ANOTHER METAL PRESERVATIVE.

Vessel owners on the coast have long been on the lookout for a composition that would resist the action of heat and that would not wash off by the action of sea water. Such a composition is now manufactured, and is successfully used in the heating and preserving of heated surfaces, says *Journal of Commerce*. It is neither effected by the greatest heat to which it can be subjected, nor can it be washed off by sea or fresh water, and it is found to be specially serviceable for the funnels of steamships and general marine work. In a recent test several plates which had been coated with the composition were subjected to the heat of a stove, and the color was wholly unaffected by the treatment. When it is desired to change the color of any object painted with the composition, it is only necessary to paint over the old surface, instead of making the futile attempt to remove the previous coating. It is claimed that this composition has an important preservative action on iron, and protects exposed iron surfaces against the effects of weather, oxidation, pitting and other ills to which they are subjected.

MARINE ENGINEERS ELECT OFFICERS.

The annual meeting of the Cleveland Marine Engineers' Beneficial association was held last week, and the following officers were elected: President, R. L. Peck; vice president, John N. Kirby; recording secretary, Henry Burton; corresponding secretary, William H. Kennedy; financial secretary, P. J. Carr; treasurer, M. B. Sturtevant; chaplain, William Kennedy; doorkeeper, Fred Harmon; outer doorkeeper, James Williams; trustees, J. B. Wood, William Kennedy, M. B. Sturtevant, John N. Kirby and C. M. Stoddard were elected delegates to the national convention, which will be held in Washington, Jan. 27. The board of supervising inspectors of steam vessels and the Pilots and Masters' Association of the seaboard will be in session about the same time.

SHIP CANAL AT BLACK ROCK.

Major E. H. Ruffner, Corps of Engineers, U. S. Army in charge of the improvement and conservancy of rivers and harbors at the foot of Lake Erie, states, in reference to having Black Rock Harbor converted into a ship canal says that the project of the improvement of the Niagara River, as adopted by the United States, is limited by these considerations: First, there can be no further deepening of the channel east of the inlet pier than is now to be found, since we would not be willing, nor would the city of Buffalo wish that we should deepen the channel over the water tunnel, at the risk of breaking into that, to the great loss of the city. The ruling depth over this tunnel may be stated as 14½ feet, at mean. lake level. Hence, boats using that channel must confine themselves to not over 13½ feet draft, water being at the zero of the gauge. To the west of the inlet pier there are four feet more of water; and the depth of 17½ feet found there may be taken as the maximum depth which the Niagara River can allow under the present project, since to gain more would involve enormous expense. In any event, the navigation of the river will always be subject to the expense and danger of the strong current, and the threatened catastrophe arising from striking the International Bridge. No navigator can look on this with less than fear.

The canalization of the Black Rock Harbor would remedy all these defects in the present project. The passing of the various rapids on the St. Lawrence by means of canals might not have been necessary could they have been passed, as this one is without the aid of a canal; yet the constant loss arising from the expense, and danger of the passage would, in time, have forced the building of canals, as now found. The Des Moines Rapids on the Mississippi River were navigated for years without a canal, yet the canal alone made navigation really satisfactory. An excavated channel through the Rock Island Rapids, instead of a canal, is not a good substitute, though much cheaper. The lower end of the Muscle Shoals Canal is to be canalized, the open river being found too swift for good navigation.

Should Buffalo grow so as to need the shores of Grand Island as dock frontage, a canal alone would enable a large class of boats to reach that region. As the law now stands all projects are unchangeable except by act of congress, no surveys, or examinations or new ideas can be entertained or discussed, or reported upon by the executive branch until called for by the positive action of congress. It is well that this should be generally known.

MARINE PATENTS.

510,877. Hull of steam-vessels. Elisha W. Babcock, Lorain, Ohio. Filed May 11, 1893. Serial No. 473,798.

CLAIM.—In a steam-boat or vessel, a hull having a flat or approximately flat bottom, a keel centrally of and extending lengthwise of the bottom of the hull, said keel, at its rear end, being cut away to accommodate the location of the rudder and propeller-wheel and being sufficiently wide and chambered to accommodate the location and operation of mechanism employed in operatively connecting the propeller-wheel with the steam-engine or driving power.

511,400. Fog Signaling Apparatus. Abner R. Bostwick and John Duffy, Detroit, Mich. Filed July 26, 1893. Serial No. 481,530.

CLAIM.—A signaling apparatus comprising a tank to contain compressed air and provided with a movable cap constituting a plunger, a single device to be operated by the compressed air, a valve therefor and mechanism in operative connection with the valve to automatically open the valve at predetermined intervals so as to release a part of the compressed air and to sound the warning.

511,372. Preserving Piles. Robert Sudden, Ventura, Cal. Filed Oct. 6, 1891. Serial No. 407,867.

CLAIM.—In combination with a pile a covering consisting of a coating of tar applied thereto which is placed thereon in series after each preceding coating has dried, a series of battens of redwood over the tar coating having tar applied to the inner surfaces thereof, a series of bands surrounding said battens, an outer coating of tar applied to said battens and over said bands, and a thick coating of beach sand applied to said outer coating of tar while the latter is still moist to form a cement, substantially as described.

MARINE INDUSTRY AT CLEVELAND.

The total tonnage for the year 1893 is 243,554.09. That for 1892 was 229,389.50; a gain for the past year of 14,163.59 tons.

Vessels cleared and entered in the district, coastwise, during the year 1893: Cleveland, cleared—sail vessels, 848; tonnage, 408,517; steamers, 1,618; tonnage, 1,498,359; total, 2,466; tonnage, 1,906,876. Entered—sail vessels, 854; tonnage, 409,044; steamers, 1,624; tonnage, 1,477,282; total, 2,478; tonnage, 1,886,326.

Ashtabula, cleared—Sail vessels, 233; tonnage, 187,019; steamers, 829; tonnage, 1,082,018; total, 1,062; tonnage, 1,269,037. Entered—Sail vessels, 230; tonnage, 186,172; steamers, 890; tonnage, 1,158,628; total, 1,120; tonnage, 1,344,800.

Conneaut, cleared—Sail vessels, 62; tonnage, 53,995; steamers, 86; tonnage, 92,449, total, 148; tonnage, 146,444. Entered—Sail vessels, 61; tonnage, 54,752; steamers, 87; tonnage, 89,252; total, 148; tonnage, 144,004.

Fairport, cleared—Sail vessels, 112; tonnage, 100,407; steamers, 327; tonnage, 458,900; total, 439; tonnage 559,307. Entered—Sail vessels, 127; tonnage, 108,401; steamers, 353; tonnage 500,213; total, 480; tonnage, 608,614.

Lorain, cleared—Sail vessels, 103; tonnage, 63,530, steamers, 128; tonnage, 119,382; total, 231; tonnage; 182,912. Entered—Sail vessels, 115; tonnage, 72,047; steamers, 102; tonnage, 92,227; total, 217; tonnage, 164,274.

Total clearances in district, coastwise—Sail vessels, 1,358; tonnage, 813,468; steamers, 2,988; tonnage, 3,251,108; total, 4,346; tonnage, 4,064,576.

Total entries in district, coastwise—Sail vessels, 1,387; tonnage, 830,416; steamers, 3,056; tonnage, 3,317,602; total, 4,443; tonnage 4,148,018.

Total foreign clearances in district—Sail vessels, 258; tonnage, 77,090; steamers, 605; tonnage, 137,874; total, 863; tonnage, 214,964.

Total foreign entries in district—Sail vessels, 179; tonnage, 46,147; steamers, 526; tonnage, 77,932; total, 705, tonnage, 124,079.

Total clearances in district, foreign and coastwise—Sail vessels, 1,616; tonnage, 890,558; steamers, 3,593; tonnage, 3,388,982; total, 5,209; tonnage, 4,279,540.

Total entries in district, foreign and coastwise—Sail vessels, 1,566; tonnage, 876,563; steamers, 3,582; tonnage, 3,395,534; total, 5,148; tonnage, 4,272,097.

Total clearances and entries in district, foreign and coastwise—Sail vessels, 3,182; tonnage, 1,767,121; steamers, 7,175; tonnage, 6,784,516; total, 10,357; tonnage, 8,551,637.

The vessels built and re-built during the year in the district aggregated 7,989 tons; lost, 3,936 tons; added to the tonnage of the district during 1893, 18,045 tons, or a total of nineteen vessels, sail and steam.

The total tonnage for the district as per enrollment is as follows:

Description of vessels.	No.	Gross Tonnage.	Net Tonnage.
Sail vessels	89	55,165.60	52,465.65
Steam vessels, wood	144	110,201.42	89,208.26
Steam vessels, iron	34	73,211.79	58,459.89
Barges, wood	9	2,751.93	2,623.09
Barges, iron and steel	1	1,601.40	1,557.31
Pleasure yachts, wood	13	254.94	203.90
Pleasure yachts, steel	2	367.01	197.47
Total	292	243,554.09	204,715.57
In the year 1892	290	229,388.50	192,779.38
In the year 1880	183	72,716.23	

The following are the number of steamers inspected in the District of Cleveland by the local steamboat inspectors:

Description of vessels.	No.	Gross Tonnage.	Net Tonnage.
Passenger steamers	62	71,869.02	57,006.57
Towing steamers	61	2,297.37	1,256.22
Freight steamers	78	91,510 63	74,588.36
Pleasure yachts	22	550.65	300.31
Miscellaneous	76	2,525.97	1,838.66
Total	299	168,753.64	134,990.12
In the year 1892	316	79,672.10	143,116.20

Enrollments issued during the year 1893	121
Licenses issued	318
Bills of sale "recorded"	136
Mortgages "recorded"	21

WORKING UNDER WATER.

There is quite an inaccurate impression generally taken on board by persons who have not given the subject of deep sea diving much, if any thought, relative to the depths at which submarine work may be carried on even with the latest and best of modern diving suits and appliances.

With good gear, work can be carried on to advantage in ten fathoms, or sixty feet, of water, fairly good work has also been occasionally recorded at fifteen fathoms, but at greater depths the pressure becomes too heavy for divers to stay under water long enough to accomplish any great amount of work.

An excellent job of deep water diving was recently published st some length in a foreign exchange as follows:

"The steamer Alfonso XII, having on board ten boxes of gold coin, each box worth £10,000, struck on a rock and sunk at Grand Canary, while on a voyage from Cadiz to Havana in 1886. It was ascertained that the specie was at a depth of 26⅔ fathoms—160 feet—and grave doubts were entertained of the possibility of any diver being able to withstand the tremendous pressure incidental to such a depth, viz.: some 67 pounds to every superficial square inch of his body. Experiments at this depth were made, and two men, Lambert and Tessier, were found equal to the perilous task. Also dresses were at length made which would remain water-tight at so great a depth.

An expedition was sent out by the Marine Insurance Co., the divers to receive a reward of 5 per cent, or £500, on each box recovered. Lambert got up seven boxes and Tessier two. So terrible was the pressure that neither man could stay below for more than a few minutes, and Lambert for some time after his return suffered from chronic paralysis of the bowels, by which he was in a certain condition reduced to the helpless condition of a babe in the cradle. Probably a tightly sealed kettle sent down empty to the same depth would have been crushed flat. As it was, the divers succeeded in finding only nine boxes out of the ten, £10,000 thus remaining below. A subsequent expedition went in search of this box, and the diver, after being down twenty minutes, was hauled up only to die. Nothing discouraged, a fresh expedition went out with two divers, from Germany.

The first of these was promptly hauled up, half dead, only to be sent ashore to the hospital, raving mad; the other went down, but returned declaring that no box was there. Whether he really got so far as the lazarette from which the pine boxes were taken is open to doubt. The pressure at such depths must be positively crushing. In the accounts of one of the deep-sea dredging expeditions, it is mentioned that when the trawl was raised from a great depth the pressure proved to have been such as to crush together the wood of the trawl beam, so that the knots started out of it."

Diver Pelkey, who lost his life two seasons ago while diving in a new armor suit of his own invention off Thunder Bay Island, Lake Huron, probably reached a depth of twenty-five to thirty fathoms while searching for the wreck of the steamer Pewabic. At the former depth he would be under a pressure of sixty-five pounds per square inch, and at the latter seventy-eight pounds per square inch. The greatest depth ever reached is recorded at 33½ fathoms, when a diver named Hooper went down to the wreck of the Cape Horn in Pichidanque Bay, off the coast of South America, and succeeding in stopping down on one occasion at that depth for nearly three quarters of an hour.

The late Capt. Eads, well known on account of his engineering feats on the Mississippi and the South Pass, gave the following statistics of the effect of working under high pressure upon divers. At a maximum depth of 101½ feet the pressure was from 50 to 51 pounds per square inch; when 60 feet was reached many of the men gave out, being affected by paralysis of the lower limbs, which, however, usually passed off in a day or two; at greater depths the symptoms were more severe, of 352 so employed 30 were seriously injured and 12 cases proved fatal.

The following table, which we find has been computed by J. J. Fletcher, C. E., and published in *Shipping World*, series No. 4, "Salvage and Wreck Raising," will serve to show the pressure in pounds per square inch at any given practicable depth of water, the pressure of the atmosphere not being taken into account:

Depth feet	Pressure sq. in. lbs.	Depth feet	Pressure sq. in. lbs.
10	4	110	47
20	8	120	52
30	13	130	56
40	17	140	60
50	21	150	65
60	26	160	69
70	30	170	73
80	34	180	78
90	39	190	84
100	43	200	86

The pressure of water may be conveniently and roughly calculated as being about 2½ pounds per square inch for every fathom in depth, thus at 100 feet, or rather more than 16½ fathoms, the pressure would be about 43 pounds per square inch, or that of about three atmospheres in addition to the weight of the actual atmosphere above.

The earliest mention of diving suits is found in the writings of Aristotle. It is also recorded that the fleet of Alexander the Great suffered much inconvenience from divers at the siege of Tyre.

THE MARINE INDUSTRY AT BUFFALO.

The port of Buffalo has now a total tonnage of 346 vesssls with a capacity of 178,605 tons.

The arrivals and clearances for the past year amounted to 10,653 with a tonnage of 9,494,559. In 1859 with nearly the same number of entrances and clearances the total tonnage was only about half the above, and in 1862 with nearly 17,000 vessels entering and clearing the tonnage was 6,089,194.

During the year Buffalo contributed 16 new vessels, averaging a total of 3,692 tons to the lake marine and enrolled 19,612 tons in the district in addition to her former fleet.

MILWAUKEE SHIPMASTERS' ASSOCIATION.

The annual meeting of the Milwaukee lodge of the Shipmasters' Association, held last week, was largely attended. The following officers were chosen for the ensuing year: President, John Cochrane; first vice president, W. J. Carter; second vice president, John Wright; recording and financial secretary, John McSweeney; treasurer, Fred Starke; trustee for three years, Albert Gibbs; delegate to the grand lodge, John Cochrane. Appointive offices remain to be filled. The installation of the new officers will take place this week. All meetings of the organization during the remainder of the winter will be held in the afternoon instead of evening.

DULUTH AND SUPERIOR.

Special Correspondence to The Marine Record.

The annual report of Collector Johnson, just published, shows a vessel freightage business for the past year at Duluth alone of 4,305,000 tons. The largest items are wheat, 597,000 tons; flour, 457,000 tons; coal, 1,173,000 tons; iron ore, 1,503,000 tons; lumber, 139,000 tons; merchandise, 170,000 tons. The Superior statement isn't out yet, but it will show about 400,000 tons of wheat, 100,000 tons of flour, 900,000 tons of coal, 80,000 tons of ore, 30,000 tons of lumber, 200,000 tons of miscellaneous freights as its chief items. Mr. Johnson shows the following tabulated statement of the business of the year for the customs district of Duluth, plus Superior:

Official Statistics of Duluth Canal and Sub Ports, 1893.

Districts.	Ports and Sub Ports.	Arrivals and Clearn's	Tonnage.	Tons Moved.	Same from Unofficial Sources. Tons Moved
Duluth	Duluth	3,305	3,834,395	3,467,420	3,246,280
	Two Harbors				1,053 890
	Grand Marais				8 659
Superior	Superior	1,820	2,491,460	1.929,742	2,429,801
Total		5,125	6,325,855	5,397 162	6,738,530

There is little new in marine circles. A great interest is taken here in the launch of the North America Saturday at Cleveland, and several Duluth people have left to take part in the incidental ceremonies.

Rail shipments of flour east have been quite large the past week, previous to the raise in rates. Many of the mills are shut down now, however. The Duluth Imperial starts up in full Tuesday and for a few weeks. This company distributes a 1½ per cent. quarterly dividend this week. It is understood that this company actually cleared in one month this fall 6 per cent. on the entire investment in its mills, elevators, etc.

Wheat receipts for the past week were about 336,000 bushels and shipments were only about 7,000 bushels. The mills are taking nearly all the track wheat as it arrives, and it looks very much as if from eight to nine million bushels would be all there would be in store here by May. The country is pretty well cleaned out and little except from railway elevators is expected.

THE SHIPMASTERS ON FREE ORE.

At a meeting of Cleveland lodge, No. 4, Shipmasters' Association the following resolution was adopted:

RESOLVED, That putting iron ore on the free list will work an injury to all lake sailors. And be it further Resolved, that we as masters of lake craft will use all honorable means to assist in having the present duty on iron ore retained. And that we will ask all sister lodges of the Shipmasters' Association to co-operate with us in sending petitions to the congressmen representing the several districts in which their lodges are situated, asking them to use their influence to have the present duty on iron ore retained. And in conformity with the above resolutions we have sent you a petition, and hope you will circulate it among the brothers and forward it to your member of congress and senators without regard to party.

Committee { J. B. HALL, WM. S. MACK, JOHN LOWE.

The following is the preamble to a petition that has been sent to all sister lodges:

The undersigned masters, officers and seamen on craft employed on the Great Lakes, the citizens of .....in state of ..... residing in the .. congressional district, respectfully represent to you, without regard to political relations whatever, our great anxiety respecting the tariff legislation now pending. This must be our excuse for addressing you in this manner. The Wilson bill while it openly discriminates in favor of some special interests, yet it abandones the protective policy. This will displace on a large scale, American for foreign products, especially iron ore, the thing which in freighting we largely earn our living; it puts on the free list that product, allowing the ores of Spain, Cuba and Africa, wherever it is mined by coolie and peon slave labor, and freighted to this country in large almost valuelesss tramp-hulls, and they manned by men that are practically homeless wanderers, even to masters whose wages are scarce equal to hostlers, and the crews of these craft working for less than our average boot black earns, and living on food that would be scant for your favorite dog. Will you ask us to be brought down, and we sons of this land of free and beautiful America, on a level with this class of labor? We number on these Great Lakes 50,000. We have homes, wives and children depending on us. Many of us homes that are only partly paid for, and if this free foreign ore comes in, we will be paralyzed as sure as fate, and suffering to us and those we love is sure to follow.

We do not exaggerate the gravity nor the danger of this situation, and we most devoutly and solemnly appeal to you to do all in your power to preserve the present duty on iron ore.

The government certainly needs the revenue from it, and we as your countrymen need the work at American wages. We cannot exist on the recompense or food given to coolie, peon or slave labor.

THE ENGLISH-BUILT WHALEBACKS.

In reply to an inquiry from THE RECORD, regarding the English-built whaleback Sagamore, Mr. J. S. Crawford, assistant secretary of the American Steel Barge Co., writes as follows:

"This steamer was built at Sunderland, England, by Messrs. William Doxford & Sons, for the Whaleback Steamship Co., Limited, of England, a corporation which has been formed to build vessels of the whaleback type under Captain McDougall's English patents, and of which company, Mr. William Johnston, senior member of the Johnston Line, of Liverpool, is president.

"The dimensions of the Sagamore are as follows: Length, 320 feet; breadth, 38 feet; depth, 26 feet.

"Her load draft is 19 feet and her cargo capacity is 3,500 tons. She has seven turrets and nine cargo hatches, and is exactly a duplicate of one of our lake whalebacks, with the exception that she carries three masts and a complete outfit for handling cargo, including four steam hoisters, derricks, cargo booms, etc.

On a trial over a measured mile, she steamed 10½ knots, with 3,200 tons of coal on board, in a very rough sea, and on her first trip from Sunderland, England, to the Danube, she averaged 10 knots per hour for the trip. She has developed fine seagoing qualities, and has demonstrated to the shipowners of England the seaworthiness and great carrying power of vessels of the whaleback type.

"In connection with this, I would also state that at a test made by Messrs. Doxford of models of different designs, among others one of the "turret" vessels built by themselves, one of the Sagamore and also one of Harland & Wolff's finest models, to the intense astonishment of all present, the Sagamore showed an enormous advantage by the ease with which she was driven, and proved conclusively to the onlookers that the spoon bow has all the advantages claimed for it by Capt. McDougall."

CREMATED AND SCATTERED.

Considerable curiosity has been occasioned in London and Liverpool, says a foreign exchange, by the strange obsequies in connection with the death of Mr. James Park, which was announced recently. The deceased gentleman was a well known and prominent shipowner and was managing director to the Shaw, Savill and Albion Line of steamers, in addition to owning sailing ships. By his will the deceased ordered that his body should be cremated at Woking in the usual manner, and that his ashes should be afterwards collected and enclosed in a glass bottle and handed over to the captain of the first of deceased's sailing ships leaving London. When the vessel has arrived off St. Catherine's Point, Isle of Wight, the course is to be altered to due north magnetic, so that the bow may point towards his native place. The captain is then to break the bottle and scatter the ashes to the four winds of heaven. It was at first rumored that one of the captains of the Shaw-Savill Line would perform this gruesome task; but it now appears that the duty will be undertaken by the first sailing ship captain in the employ of the deceased who shall sail first.

The Marine Record,

ESTABLISHED 1878.

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FIRE PROTECTION.

Every vessel owner and master can call to mind cases where destructive fires have broken out in the lamp rooms of steamers. They are also aware of the fact that steamers and their cargoes have become total losses from fire originating in the lamp room, and yet, few steamers are fitted with a steam fire extinguisher in this compartment, though the protection might be placed there at a merely nominal cost.

The knowledge that vessel property is almost a non-paying investment these times requires vessel owners to guard against every element of expense in the management of their boats, yet it should require but slight argument to prove that a few days' detention to any boat undergoing repairs for fire damage perhaps in the busy portion of the season of navigation would cost much more than it would take to fit out a fleet with steam fire extinguishers in their lamp rooms.

To many owners and builders this feature will only require bringing to their attention to be immediately remedied, and, as we have said, the element of expense in making the connection or extension is so nominal that there can be little or no excuse for anyone allowing a fire originating in the lamp room to cause any serious damage or inconvenience. Certainly such a casualty would not take place if extinguishers were properly fitted.

DEFINING HARBOR LINES.

Lake ports that in the course of time may become prominent factors in the commerce of the north-west should no longer ignore the situation which the earlier established shipping and receiving points are now laboring under. If we take as examples, to better illustrate our views, the ports of Chicago, Cleveland and Buffalo, we find that they are more or less hampered by the assumed rights of railroad corporations and other influential bodies along their water fronts, both in harbors and rivers. These combines insist upon occupying, by right of tenure, the most valuable land bordering on a waterway, and with eminent legal counsel uphold every point of vantage which they have obtained, hence, the utmost difficulty is experienced in attempting to oust them from their questionable acquisitions by process of law, either municipal, state or national.

It is therefore of great importance that even the most insignificant port at the present time should establish harbor lines beyond which no entrenchment will be permitted. The existing provisions of United States law relating to the establishment of harbor lines are contained in Section 12 of the river and harbor act approved September 19, 1890, and read as follows:

"SECTION 12. That Section 12 of the river and harbor act of August 11, 1888, be amended and re-enacted so as to read as follows:

"Where it is made manifest to the Secretary of War that the establishment of harbor lines is essential to the preservation and protection of harbors, he may, and is hereby authorized to, cause such lines to be established, beyond which no piers, wharves, bulkheads or other works shall be extended or deposits made, except under such regulations as may be prescribed from time to time by him; and any person who shall willfully violate the provisions of this section, or any rule or regulation made by the Secretary of War in pursuance of this section, shall be deemed guilty of a misdemeanor, and on conviction thereof shall be punished by a fine not exceeding $1,000, or imprisonment not exceeding one year, at the discretion of the court, for each offense."

The municipal government of even those ports whose shipping industry is of meager volume now need not wait for serious encroachments to be made before presenting their case to the proper authority. It is the duty of each and every port on the Great Lakes to have a clearly defined harbor demarcation beyond which no permanent title or obstruction can be allowed, and in thus conserving local rights ward off untold litigation in the future.

In this connection, the twin cities at the head of lake navigation, viz: Duluth and Superior, have taken the subject in hand with a vim and discretion that will ultimately reflect the greatest possible credit on the leading men residing there. Through the well timed efforts of a few citizens who can see beyond "the end of their noses," a harbor committee has been formed to improve the natural facilities now offered at those points, and, endorsed by the government officer in charge of the conservancy of rivers and harbors in that district, an enormous area, having a depth of twenty-two feet of water, will no doubt soon be heralded as among the facilities which the head of the lakes offer to transportation by water.

TO PROTECT FREIGHT RATES.

Up to the present time there has been no method advanced for the regulation of lake freight rates next season on which a majority of interests could unite, and, in truth, the subject is a most intricate one to handle.

Each owner naturally desires to control the management of his own property or that placed under his charge. There are fears expressed that a laying up committee might in some cases have such representations made to them as to decide in an arbitrary manner on the sailing or laying up of certain proportions of tonnage, and the thought is also prevalent that the proportion of tonnage ordered to remain idle might lie at the docks even when there was a chance to earn at least the interest on the investment represented by the idle boats.

Vessel owners, however, seem to be at one relative to the subject of bringing about a delayed opening of general navigation in the spring, but even on this point there are many pertinent reasons to offset, if not render such an agreement irksome, as for instance the large tonnage holding cargoes for spring delivery. They, at least, are bound to forward cargoes with all due dispatch, and that means on the early opening of navigation. Again, the lumber, coal, and not unlikely, consignments of iron ore may require to be moved at an early date, thus necessitating fitting out, engagement of crews, etc., and once in running order the influences are many to keep the boats moving. There is also a proportion of tonnage outside of which any future agreement must be ratified by the remainder. The line boats, tonnage owned by mining and lumber companies, cut no inconsiderable figure in determining the action of a laying up committee and then such a committee ought to be a perfectly disinterested one. At the same time they must have such a grasp of comprehension as to anticipate the transportation movement and its fluctuations week by week so that vessels would not be crowded on any lake so as to vitiate going rates of freight.

After viewing the subject from various standpoints the minimum freight rate system with a penalty clause attached would seem to be the best preventative and safeguard for the general tonnage yet devised, though the question will, no doubt, be thoroughly threshed out at the annual meeting of the Lake Carriers' Association. There is every reason to believe that the association will meet the existing conditions and protect its members in the prosecution of their transportation business. Further than this, the field of operations of the association might well be enlarged and cognizance taken of matters hitherto held as being without the pale of active representation by the united body.

THE number of vessels which entered and cleared at the port of Buffalo during the past season was greater than in 1892, but the total tonnage was a trifle less. The receipts of lumber were nearly 32,500,000 feet greater than last year. The receipts of flour were 915,924 barrels more than in 1892, and greater than in any other year on record. Receipts of wheat were 9,885,433 bushels less than last year, but the total of all grain, and of all grain including flour reduced to wheat, was greater than in any other year on record, and 11,205,731 bushels more than last year. The receipts of oats and barley this season were larger than in any other season, and the shipments of coal westward were larger this year than any other except in 1892. Such a showing ought to argue very favorably in securing the appropriation asked for from the general government to improve, extend and protect the outer harbor at Buffalo. The most liberal expenditures for the better conservancy of the approaches to this important terminal port is justly due its great volume of commerce.

THREE well known vesselmen whose physique would have been pronounced as a guarantee against hasty dissolutions have been summoned hence during the last few days, and it is almost beyond credence to admit their loss. Capt. S. B. Grummond, than whom few vesselmen were better known, passed away quietly at his home in Detroit this week. Also Capt. Robert Gain, at Port Huron, and Capt. John Stevenson, at Detroit. THE RECORD extends condolences to the bereaved families and friends of the three shipmasters.

LAKE CARRIERS' ASSOCIATION.

A special meeting of the finance committee of the Lake Carriers' Association was held at the office of Capt. Thomas Wilson, in Cleveland, on Wednesday morning. There were present: John Pridgeon, jr., and A. A. Parker, of Detroit; Charles H. Keep and Capt. James Brown, of Buffalo; H. H. Brown, M. A. Bradley, Capt. John Mitchell, H. D. Goulder, Esq., Capt. J. W. Moore, B. L. Pennington, Capt. J. B. Hall, Capt. William S. Mack, W. C. Richardson, H. G. Dalton, H. A. Hawgood, Capt. George P. McKay, Capt. Leon and Capt. Thomas Wilson.

The question of providing plans for improving the earnings of vessel property during the season of 1894, for which a committee was appointed at the last meeting, is no nearer settled now than it was when it was first brought up. Several members of the committee were present and said that every vessel owner and shipper that they had visited had a different plan, and the committee thought it best to make no report until the annual meeting at Detroit on the 17 inst. This report brought out a general discussion and Capt. Brown submitted the ideas of Buffalo vessel owners in so far as his inquiries among them had gone. Some of those present at the meeting were in favor of fixing a minimum rate, while others suggested that the season of navigation be delayed in its opening until May 15 or June 1, while others were in favor of only fitting out part of the fleet in any event.

Mr. M. A. Bradley asked how many members present would sign an agreement and give bond not to carry ore from the head of the Lake Superior for less than $1 a ton, or coal up for less than 50 cents, or agree to lay up any part of their fleet that a committee appointed for that purpose might designate.

Capt. W. C. Richardson said either plan would answer if the bond was made large enough. Capt. Thomas Wilson was in favor of the latter plan. Mr. B. L. Pennington said that it was understood generally that the fleet would be laid up a portion of next season and that arrangements should be made with the masters to bear part of the loss. Mr. H. H. Brown thought the masters understood the situation thoroughly, and that owners would have no trouble making arrangement with their captains. Other owners also spoke to the same point and showed where reductions of pay had been made by several ship-owning firms. The statement that at least two managers had declared dividends of 8 to 10 per cent. on the season's earnings of their "wild" tonnage, while other boats were running in debt under similar rates of freight was explained as resulting from well placed chartered boats engaged under a season contract—therefore not "wild" tonnage, as ignorantly quoted from a paper. The meeting adjourned after giving their attention to some details relative to the annual meeting to be held in Detroit on the 17th inst., the feeling was general, however, that the hall so generously offered by the Shipmasters' Association and in which the last annual meeting was held, was much too small for the purpose this year.

A vessel owners meeting was then convened and the committee appointed at the last meeting to formulate a plan to raise funds for sending delegates to Washington to defeat the free ore clause of the Wilson bill made the following report, which was largely signed:

"The following vessel owners agree to pay 1 cent per ton on the net registered tonnage of vessel owned, controlled or managed by us toward a fund for meeting the expenses of agitating in Washington against the proposed putting of iron ore on the free list, which will seriously injure the lake carrying trade. The disposition of the fund shall be controlled by the subscribers."

Capt. William Mack said it was necessary to have a man on the ground at once, and made a motion that one be selected to go to Washington as soon as possible to watch matters and keep the local vessel men posted. Capt. James Corrigan, H. A. Hawgood and Capt. William S. Mack were appointed a committee to select a representative to go to Washington and remain there as long as necessary. The iron ore men have selected George H. Ely to represent them, and the Detroit vessel men will probably elect Hon. F. W. Wheeler, of West Bay City.

Capt. Mack said that the matter had been taken up by the Shipmasters' Association, and that an effort will be made to have each lodge send a delegate to Washington.

It is expected that the committee appointed to select a representative to go to Washington will make a choice during the next few days. Unless some important matter comes up, no more meetings of the finance committee of the Lake Carriers' Association will be called until after the annual meeting is held.

ANNUA. REPORT OF MAJOR SEARS.

The annual report of Major Clinton B. Sears, Corps of Engineers United States army, on the improvement of rivers and harbors on Lake Superior has just been issued. The report is a very interesting one, showing all the improvements made and proposed in the waters at the head of the lakes. In the general remarks the major says:

"As congress has sanctioned by legislation the project of a 20 foot waterway between Buffalo and Duluth, and as the channels in Superior and St. Louis bays are the last connecting links in this chain of improved navigation, it may be proper to invite attention to the wisdom of providing for an early increase in the depths of these channels to an available depth of 20 feet, which means 22 feet in actual depth, so as to have them ready to meet the completion of the 20 foot channel at the Sault Ste. Marie and elsewhere. The great bulk of the commerce passing the Sault Ste. Marie comes to Duluth and Superior, and unless vessels drawing 20 feet can readily and safely enter the Superior and Duluth entrance and get up to their docks, the rest of the improvement, costing very many times that of betterment needed at this end, will be of small account. The ruling depths in the portions of the harbor dredged by the United States are:

	Feet.
In canal....	17
In the inner basin or harbor	16
In channel on north shore of St. Louis bay for a distance of about 12,900 feet	16
In new channel east of Rice Point	16

Relative to the Portage Lake canal Major Sears says:

"The improvements consist of entrance piers at the harbor entrances on Lake Superior and Keweenaw bay, canals and canal revetments, dredged cuts and channel ways, lights and buoys. There are no locks. When the United States assumed charge the piers and revetments were, and are now, in a dilapidated condition, bars that formed at the harbor entrances, and many places in the channel ways had shoals by deposition of material.

"As the waterway is intended for the use of all vessels that navigate Lake Superior, and is actually used by a large proportion of them, it is necessary that the depth and width of the channels shall at least be equal to that of the St. Mary's Falls Canal, which now limits the maximum draft and dimensions of the largest vessels which run to Lake Superior.

"The last river and harbor act appropriated $50,000 for improvement, which is being expended in dredging the existing channels to a 16-foot depth and in repairing some of the worst portions of the canal revetments.

"The condition of the waterway has been greatly bettered since the United States acquired ownership, and no complaints from vessel men have been received this year. A least depth of 14 feet exists throughout the waterway. A legislative enactment imposing severe penalties for a violation of the established rules and regulations for the use of the canals is urgently needed."

In his report he also recommends that the government own a dredging and pile driving plant, and says:

"The mere fact of such ownership will exert conservative influence on the bids received on government work, and doubtless result in the United States receiving more favorable contracts. The cost of such a plant is $65,000 and could be divided among the various works in proportion to their relative importance."

It is of great value to note that the major's report is embellished with line drawings, illustrating some of the principal harbors, their soundings and the work accomplished during the past fiscal year within his district.

THE IRON ORE OUTLOOK.

A review of the ore year for the Lake Superior region has just been issued by the secretary of the Duluth Iron Stock exchange:

"The year," he says, "will go down in the history of the iron trade as that in which most stupendous ill fortune fell the mines of the older Lake Superior ranges."

The shipments from all of the ranges show a falling off from 1892 of from 35 to 50 per cent. The Gogebic range has dropped from first place in shipments to third, and Marquette has again assumed the lead. The output by ranges is as follows: Marquette, 1,684,629 tons; Menominee; 1,456,632; Gogebic, 1,272,810; Vermillion, 815,620; Mesaba, 605,610.

"The output for 1894," concludes the review, "from the standpoint of the producer is most uncertain. Companies are now mining ore that is not sold, chiefly to give employment to their idle men. The two disturbing factors are the free trade bugbear and the Mesaba range. With the passage of the Wilson bill, the ores of Cuba will crowd lake ores. The conditions of the iron ore trade which have been in the last three years tending to the point where only the rich and strong can survive, has apparently now reached that point, and the immediate future will be full of important developments."

CROSSED THE RIVER.

Capt. Stephen B. Grummond, one of Detroit's foremost business men and vessel owners, died Tuesday morning at his home, 810 Jefferson avenue. He had been ill since November 4 and the disease that caused his death was senile gangrene. Mr. Grummond had gradually been growing weaker and his death was expected at any moment. He was surrounded by all the members of his family with the exception of his son Grant, who had just left for the office, and daughter Edith, who is at present in Holland.

The flags of the city were placed at half mast as soon as the death was announced. Capt. Grummond has been intimately connected with the municipal government, having been elected mayor in 1883. All the ex-mayors in Detroit, consisting of seven, will attend the funeral in a body. A battalion of police under command of superintendent Starkweather, will lead the funeral cortege. Capt. Grummond was one of the police commissioners at the time of his death.

Capt. S. B. Grummond was born near Marine City September 18, 1834, and came from sturdy Scotch stock. His father, Stephen Grummond, Sr., came to Michigan from New York state in 1807 and settled on the right bank of the St. Clair river. He kept a general store. His son early evinced a liking for the life of a sailor and sailed the lakes during the summer, while he studied

CAPT. STEPHEN B. GRUMMOND.

during the winter. He was the owner of a good sized sailing vessel before he was of age. In 1855 young Grummond came to Detroit and purchased another vessel. From this time on he turned his attention to the buying and selling of vessel property. Mr. Grummond worked up a profitable tug and wrecking business which is now one of the largest on the lakes. He was also owner of Grummond's Mackinac Line. His enterprise and straightforward business methods secured him a great deal of business and as a result he accumulated a large fortune, the most of which is invested in real estate.

In 1861 Captain Grummond married Miss Louisa B. Prouty. The union was blessed with eleven children of whom seven are still living. He was a Democrat in his younger days but ever since the election of Lincoln has been an ardent Republican. He has held several of the most prominent offices in the city government, including that of mayor. He has also been an alderman, police commissioner and a member of the board of estimates.

Capt. Grummond was well liked by all who knew him and although seemingly brusque at times, it concealed a true and honest heart. He was persistent and fearless, and when he condemned never sought to spare the term or pick his words. He was as open in his commendation and no friend doubted for a moment the loyalty of his friendship. His death makes a wide gap in the ranks of Detroit's active, energetic business men. Socially, he was a man of broad and generous impulses and always among the foremost in aiding every good and deserving work. He will be sadly missed.

THAT LUMBER TARIFF.

Capt. James Davidson, of Bay City, visited Chicago the other day, is one of the largest builders of wooden vessels in the United States, using from six to eight million feet of lumber during the year.

Speaking of the schedule in the proposed Wilson tariff bill, which removes all duty upon sawed timber and lumber, he stated as follows:

"In my opinion the proposed removal of the duty, if carried into effect, will have a most disastrous effect upon Bay City, Tawas, Oscoda, Alpena, Cheboygan and other flourishing towns in the lumber districts. There are many million dollars invested and thousands of men employed in the saw mills of this section, and it will be impossible to operate them in the same manner they are now, if a deluge of Canadian cheap lumber is to be unloaded upon us.

"In addition there is an army of tug boats, boomsticks and vessels engaged in the lumber carrying trade aggregating in value several millions of dollars and giving employment to a large number of men, which must seek other occupations if the lumber output in this country be curtailed, and these will be replaced by Canadian boats, manned by cheap Canadian crews, if this tariff change be carried into effect.

"I do not care to predict that it will result in the total abolition of the saw mill business in Michigan, but it will certainly cripple it to a large extent. Lumber manufacturers in the United States cannot compete with Canadians, because in Canada every form of labor is much more poorly paid than in this country. For instance, in saw mills Canadian wages average from 90 cents to $1 per day, while in Michigan from $35 to $150 per month is paid. Choppers are paid in like proportion, and for these reasons lumber can be produced more cheaply in Canada than in the United States. The only way by which our lumber men can compete is to reduce the wages of the laborers to the Canadian scale, and while some of them may do this, I think the majority will prefer to abandon the business.

"The sentiment against the removal of the tariff on lumber is very strong in Michigan, and I know I voice the wishes of the lumber district population when I say that every honorable effort will be made by us to defeat the lumber schedule when the bill comes up for passage.

"The pine lands in Canada are extensive and will furnish enough lumber to supply the demand for several years, so there is no hope that the lack of logs will offer any obstacle to Canadian operations, at least not until the business has been practically ruined in this country."

THE WESTERN SHORE OF LAKE MICHIGAN.

The annual report of Major James F. Gregory, Corps of Engineers, U. S. Army, upon the improvements during 1893 of rivers and harbors on the Western Shore of Lake Michigan, is an official epitome which all interested in the development of these harbors should carefully peruse.

Besides harbor lines having been adjusted at Milwaukee and Oconto, several harbors and sections have been examined and surveyed by the engineers staff and a synopsis of the improvements made at the following harbors is contained in the annual report: Manistique, Cedar River, Menominee, Menominee River, Oconto, Pensaukee, Green Bay, Sturgeon Bay, Ahnapee, Kewaunee, Two Rivers, Manitowoc, Sheboygan, Port Washington, Milwaukee, Racine, Kenosha, Waukegan, and Fox River.

The Major's report is well illustrated with drawings, and the whole is presented in a concise lucid manner, furnishing all the facts desirable for any one to know.

MARINE CITY SHIPMASTERS ELECT OFFICERS.

The following is a list of the officers elected at the annual meeting of the Shipmasters' Association, branch 8, Marine City, Mich.: President, G. A. Shaw; 1st vice president, Wm. Burns; second vice president, Wm. Tomlin; treasurer, R. A. Cottrell; financial secretary, W. H. Scott; recording secretary, J. A. Ward; chaplain, T. E. Walker; marshal, Wm. Hagan; warden, Geo. Fish; sentinel, Andrew Yax; delegate to grand lodge, Geo. A. Shaw.

AERIAL NAVIGATION.

The current number of *Aeronautics*, contains a paper by Professor Langley of the Smithsonian Institute, on Aerial Navigation, and also other interesting matter relating to Aerostatics. This fascinating subject is now attracting much popular attention, and many of our readers would doubtless be interested in knowing of the publication of the paper referred to—especially as it is by so distinguished an authority,—and also that there is a journal especially devoted to the subject of aerial flight. *Aeronautics* is published by M. N. Forney, 47 Cedar street, New York.

THE SOUTH MILWAUKEE WORKS OF THE BUCYRUS STEAM SHOVEL AND DREDGE CO.

ILLUSTRATED.

This company was originally established at Bucyrus, Ohio, about ten years ago. From small beginnings it grew and increased and the original ground on which it stood became so crowded that a new establishment became imperatively necessary for the carrying on and development of the business. The work executed by this company is divided into five leading specialties, as follows: Steam shovels, light dredging machinery, heavy dredging machinery, railroad and locomotive cranes and wrecking cars, placer mining machinery (Bucyrus amalgamator system).

Under these headings are included a great variety of auxiliary appliances and machines connected with similar work, such as centrifugal pumps, ballast unloaders, pile driving machinery and machinery for public works. The recently completed plant is located at South Milwaukee, Wis., on the line of the Chicago & Northwestern Railway ten miles south of the city of Milwaukee and it is planned on a more perfect and extensive scale than any other establishment of its kind. The ground occupied comprises fifteen acres, divided into the main establishment and shipyard located on the harbor on the lake shore three-quarters of a mile distant. Here a private and commodious harbor is secured with ample dock facilities and connected with the main works by a belt line railroad. The general plan of the buildings and a cross section of the machine and erecting shops are shown on the accompanying cuts. The buildings are of steel, brick and glass and comprise the following:

Offices, 40 x 60 ft., three stories; main building, 120 ft. x 240 ft., with overhead traveling electric crane the entire length; smith shop; plate and structural iron shop; foundry, with overhead traveling electric crane; pattern shop; carpenter and wood shop; pattern storehouse; general storehouse; power house. Referring to the plan it will be seen that the works are planned with a view of systematic extension so that the capacity can be more than doubled as future requirements demand and the works when thus added to will be a complete and systematic whole. The defects which are so manifest in nearly all great establishments which are the result of growth will thus be obviated. The buildings are heated by the hot blast ventilating system. A complete system of standard gage tracks connect all the buildings with one another and likewise a narrow gage track for hand trucks as indicated on plan and a transfer table provides access to the construction tracks in end of main building. The distinguishing features of the plan are that all the buildings, with the exception of the offices, are ground floor only and that electricity furnishes the sole means of distributing power throughout the entire plant. The reasons for adopting electric distribution of power are as follows:

1st. It permits of complete isolation of the boiler and power plant from all of the buildings.

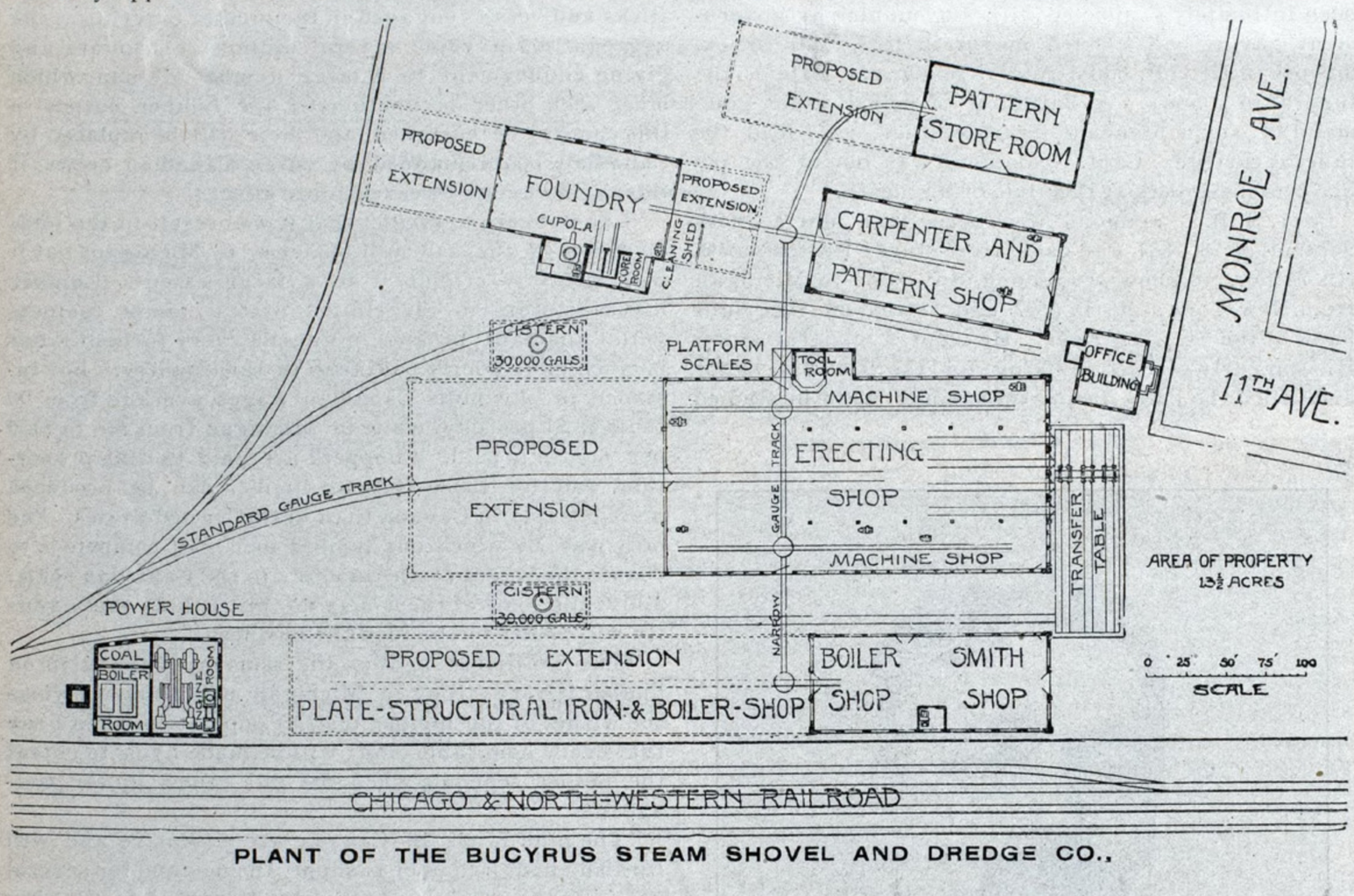
2d. It permits of the ready and convenient distribution of any desired amount of power to any desired place and at any desired speed.

3d. It avoids the wear and tear and loss of power on machines that are used occasionally or intermittently.

4th. The electric system lends itself to a variety of subsidiary uses such as electric light, electric welding, electric traveling cranes, electric portable drills, etc.

The power is distributed from a central power house to the various localities where power is required as follows:—2 motors, 15 h. p., machine shop; 2 motors, 5 h. p., boiler shop; 2 motors, 5 h. p., pattern shop; 1 motor, 15 h. p., smith shop, blower; 1 motor 15 h. p., cupola blower; 1 motor, 5 h. p., casting shop; 3 motors, 4 to 12 h. p. foundry crane; 3 motors, 5 to 15 h. p., erecting shop crane. Total 15 motors and 166 h. p.

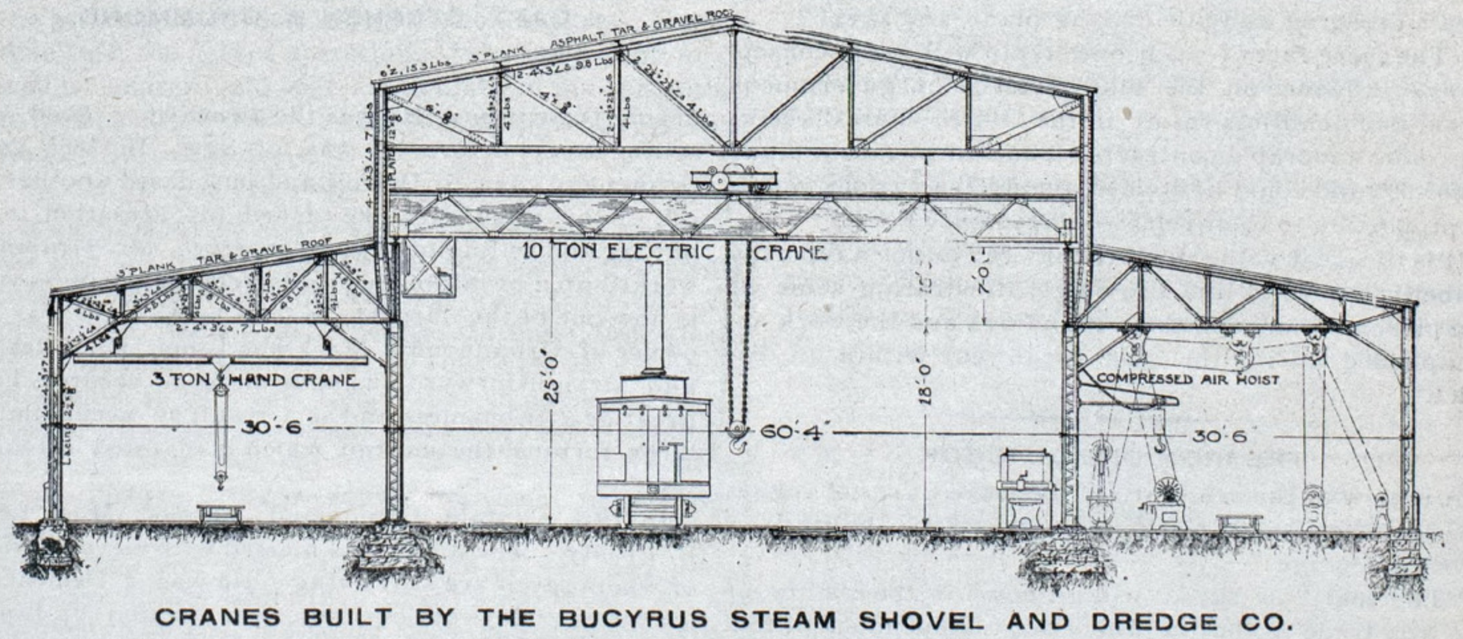
Two multipolar generators, each of 150 h. p. (one of which is a reserve) driven by a Corliss engine are employed. The larger motors and generators are of slow speed type so that connection can be made from the motor direct to the line shaft with one belt. Referring to the illustration, it will be seen that the roof of the main building is 120 feet span, divided into one central span 60 feet and two side spans of 30 feet. One of the side spans is used as a machine shop for the lightest tools and the heavy tools are placed out along the edge of the central floor so as to be under the field of the overhead traveling crane. The smaller machine tools in which the work to be lifted is beyond hand power are served by compressed air hoists suspended from light jib cranes attached to the walls or to the pillars of the building. Compressed air is used for the foundry hoist to the cupalo platform, and an air cylinder having a tubular plunger is sunk in the ground and operates the elevator platform by direct lifting. Compressed air is used for blowing out cylinder castings and for testing small engines in the erecting shop. The compressed air is furnished by a duplex air pump of the American air break type, as used on locomotives. This is placed in the engine room and a receiver kept charged at all times to the requisite pressure. There is no accumulator and the apparatus is entirely automatic in its action.



PLANT OF THE BUCYRUS STEAM SHOVEL AND DREDGE CO.

The officers of the company are: William Hamilton Harris, president; H. P. Eells, vice-president and treasurer; A. B. Stetson, superintendent; W. B. Crittenden, general manager; A. W. Robinson, chief engineer, and J. M. Millman, secretary. The offices of the company are in a separate building. On the ground floor are the business offices, with the general manager, superintendent and secretary. The whole of the second floor is devoted to the drawing office with the chief engineer's office, which has accommodation for fourteen draftsmen.

The work turned out by this company is of a very high order and of a varied description, necessitating a very complete system of records. The range of work runs from the lightest sectional steam shovel capable of being transported on a mule's back to the largest seagoing dredge of 10,000 cubic yards capacity, and the dredges that have already been built number over twenty sizes, running up to the most powerful dredges in the world.



CRANES BUILT BY THE BUCYRUS STEAM SHOVEL AND DREDGE CO.

BRONZE PROPELLER WHEELS.

ELECTRIC LAUNCH AND NAVIGATION CO.,
JACKSON PARK, CHICAGO, ILL., Nov. 4, 1893.

MR. G. DOUGLAS PETRIE, Agent, 39 and 41 Cortlandt Street, New York.

DEAR SIR.—Replying to your inquiry on the subject, I take pleasure in saying that the propeller wheels of our steam launches, which were cast of Parsons' Manganese Bronze, fulfilled every requirement and gave excellent satisfaction. There were fifty-four of these launches in daily use from 9 a. m. until 10 p. m. during the six months of the World's Columbian Exposition.

Yours very truly,
(Signed) C. H. BARNEY, Superintendent.

NOTES.

OUR thanks are due the Ashton Valve Co., Boston, Mass., 107 Liberty street, New York, and 218 Lake street, Chicago, for a handsome calendar on which is a gravure entitled "Noontime at the Old Homestead."

IN 1890 there was more iron ore imported by the United Stated than during any other year in its history, the entire amount being placed at 1,246,830 tons. It is in order to consider how high the imports would reach if or when iron ore is admitted free of duty.

IN the list of merchant vessels to which official numbers were assigned by the Bureau of Navigation during the week ending December 23rd, the lake tonnage exceeds that of all other portions of the country combined. This, however, is not singular when it is stated that the seven vessels registered at all other ports aggregate a tonnage of 357, and the Toledo owned steamer, Mohegan, built at Mariue City, Mich., has a gross tonnage of 1,217.

SOME interesting reading on the cost of cablegrams is furnished by the tariff books of cable companies. The rate per word from New York to South Africa is $2.49; to Zanzibar, $2.15; to New South Wales via. one route, $1.45, and via. another line, $3.37. The rate to China is $1.96, and to Japan $2.21. Messages to Honduras, Guatemala and San Salvador have a published rate of $7.03 per word. This rate, owing to a circuitous route, is the climax of cable tariffs.

OFFICERS in the service are much interested in the recommendations made by Secretary Carlisle for more new vessels. During the extra session two vessels were authorized—one to replace the wrecked Gallatin, on the New England station, and one to replace the Johnson on the Great Lakes. Appropriations for both these vessels are to be made in the Sundry Civil appropriation bill, and the Secretary recommends the construction of four more vessels—one cutter for the Great Lakes to replace the Perry, ordered to the Pacific, two for the Pacific station, and a small boarding vessel for San Francisco.

THE American Ship Windlass Co., of Providence, R. I., has received an order from Capt. James Davidson, ship builder at West Bay City, Mich., for one steam capstan windlass to handle 1¾-inch chains, and three steam capstan windlasses to handle 1½-inch chains, and also for one steam capstan for delivery within the next two or three months. Capt. Davidson has used the windlasses made by this company for nearly twenty years, and has closely observed other styles in the market so as to judge for himself which he prefers. He concludes the letter in which he orders these machines of the American Ship Windlass Co. by saying, "You must understand that we think well of your machines from our continual use of them, and there is no question but that they are the best that are made.

WILLIAM L. BROWN, President.

WALTER F. COBB, Vice President and Treasurer.

W. I. BABCOCK, Manager.
O. R. SINCLAIR, Secretary and Asst. Treas.

Chicago Ship Building Company,

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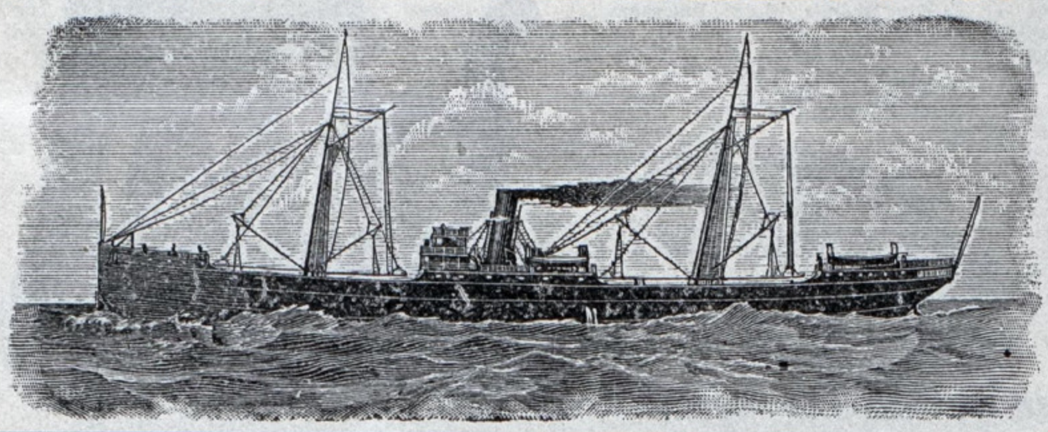

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F. L. GILBERT, Secretary.

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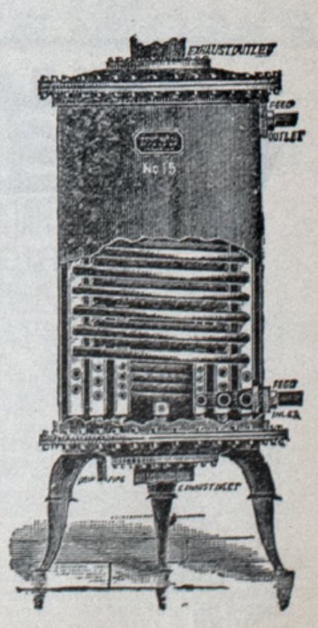

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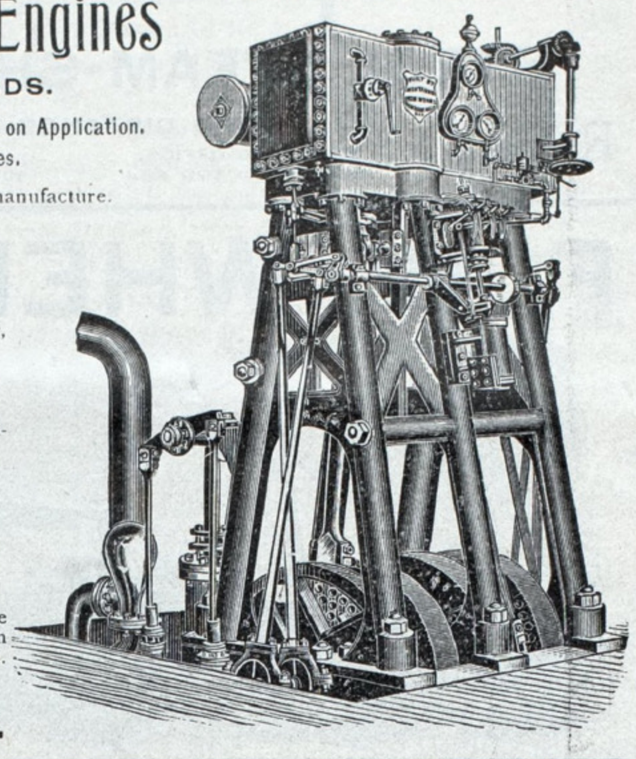

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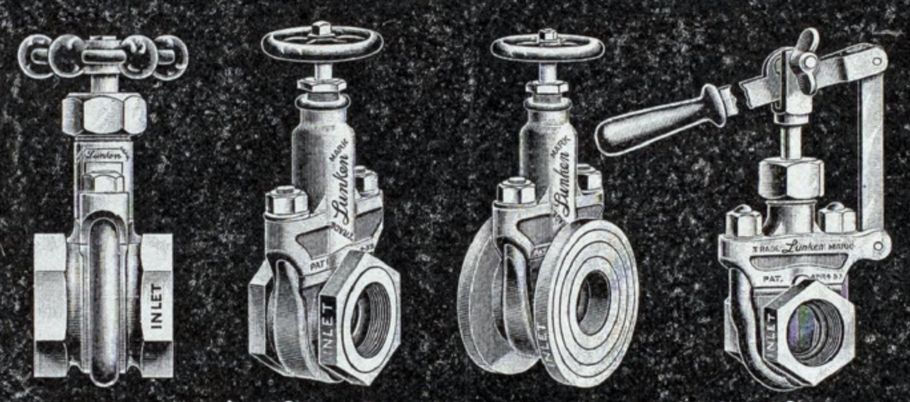

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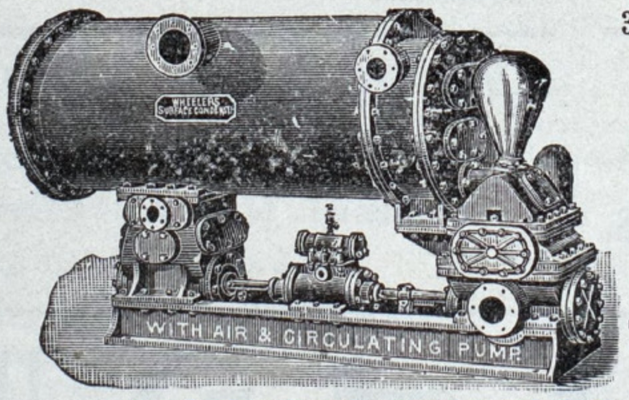

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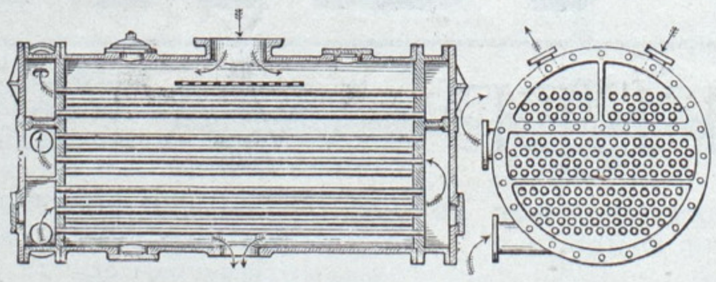

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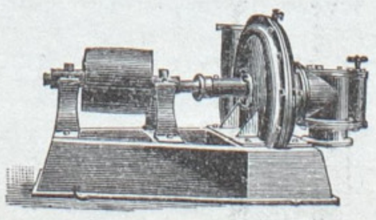

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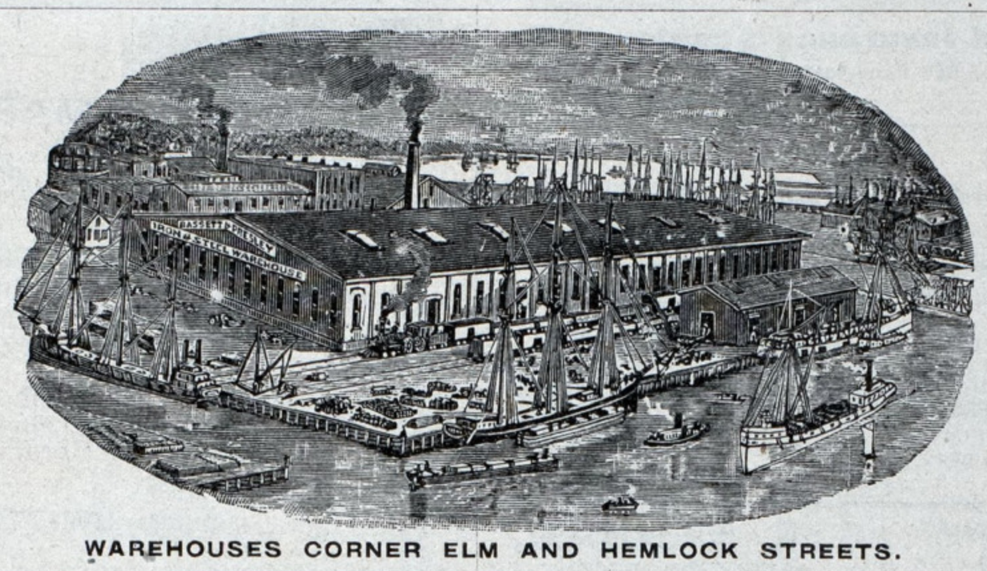

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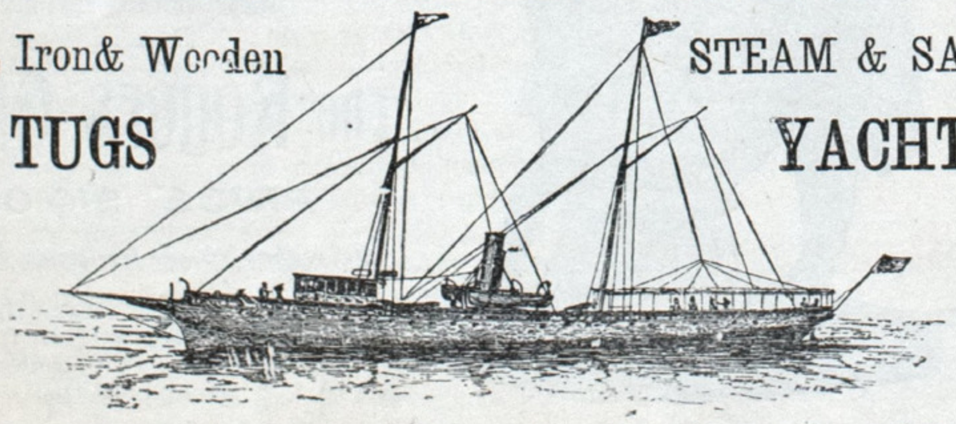

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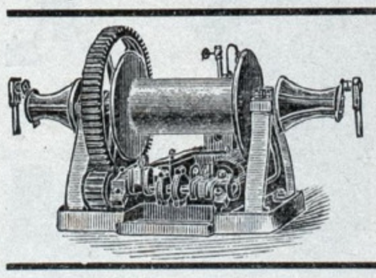

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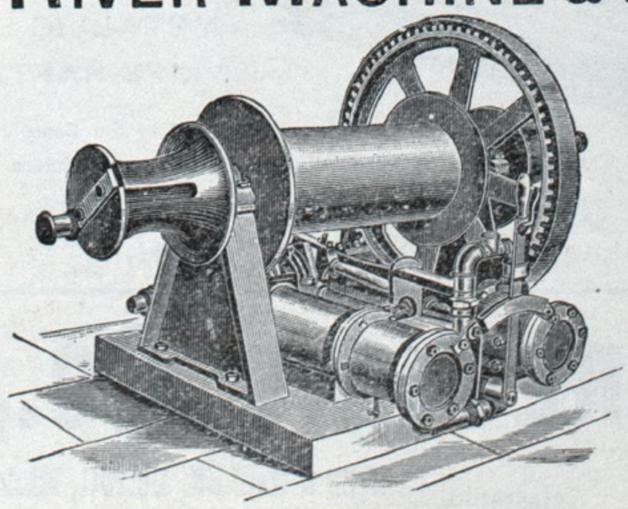

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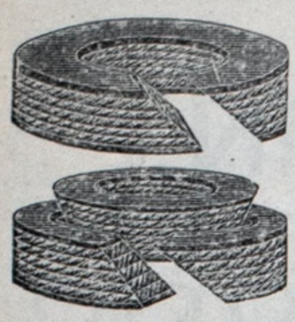

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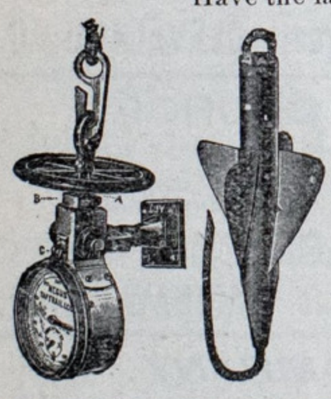

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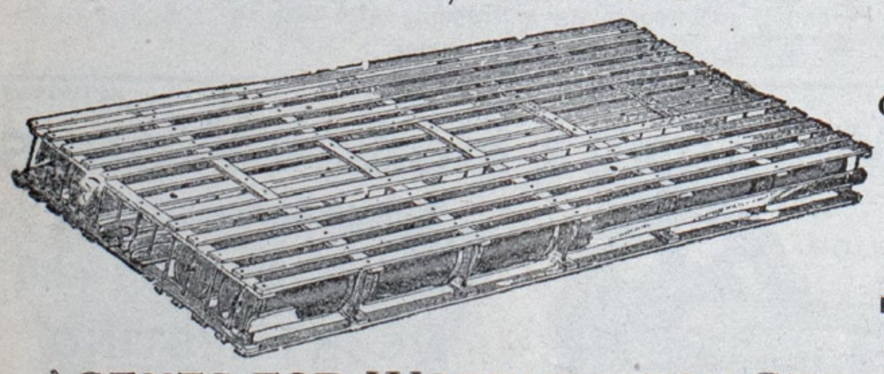

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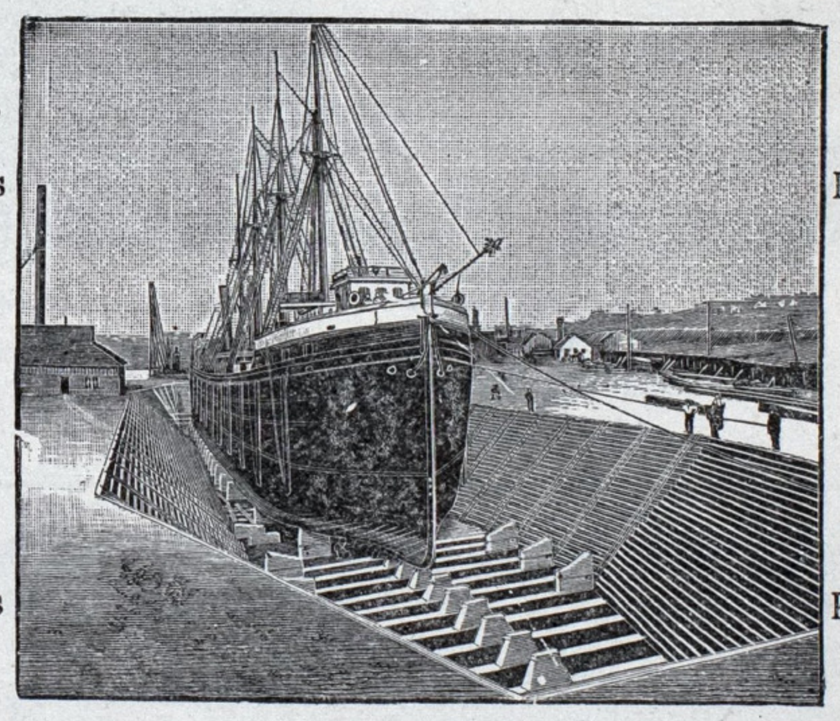

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